

## SECTION 100

### TECHNICAL DOCUMENTATION

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## 15 100.1 REFERENCES

16 (100A) WASHINGTON STATE FERRIES - *Vessel Design Standards for Drawings Using*  
 17 *AUTOCAD (dated February 2003, Revision -)*

18 (100B) NATIONAL FIRE PROTECTION ASSOCIATION - NFPA 312, *Standard for Fire*  
 19 *Protection of Vessels during Construction, Repair and Lay-up*

20 (100C) Code of Federal Regulations - 46 CFR Sub-chapter S

## 21 100.2 INTRODUCTION

22 This Section contains the Contractor Design and Provide general requirements for  
 23 specifications, drawings, manufacturers' technical publications, reports, plans, calculations,  
 24 analyses, photographs, and other technical documentation. These requirements are  
 25 supplemented by requirements given in other sections for specific drawings, analyses, and  
 26 other documentation.

27 *For WSF Fleet-wide Standardization purposes, End No. 1 of the Vessel shall always be*  
 28 *considered the bow, and this designation shall delineate port and starboard, fore and aft*  
 29 *wherever they are addressed in the Technical Specification.*

## 30 100.3 GENERAL

31 Provide all planning, scheduling, design development and engineering; all Working  
 32 Drawings, schematics, procurement specifications, purchase orders, and other items and  
 33 documentation as are required to supplement and implement the information contained in the  
 34 Technical Specification in order to accomplish the substance and intent of the Work outlined  
 35 in all Volumes of the Contract.

All technical documentation prepared under this Contract shall be submitted to, and approved by, the WSF Representative during the applicable stage of Work: Phase II Technical Proposal or Phase III Detail Design and Construction. See this Section of the Technical Specification and **VOLUME III, CONTRACT PROVISIONS** for requirements regarding schedules of deliverables and interim (draft) and final submittals of design documentation; as well as for additional provisions regarding WSF and Authoritative Agency reviews and approval of drawings, specifications, analyses and other design documentation.

If plans, reports or other written material are prepared by the Contractor or any of its sub-contractors or design agents using computer word processing equipment, it shall be delivered both in final paper form and identically on CD-ROM or DVD-ROM media, in the format of MICROSOFT® Word™ 2003, Word for Windows™, or convertible equal. The FINAL approved product shall be delivered to the WSF Representative.

A copy of all drawings and other technical documentation and related correspondence submitted to and received from the Authoritative Agencies shall be provided to the WSF Representative within twenty-four (24) hours of their receipt by the Contactor.

Material samples and copies of invoices, material certifications, test reports, metal analyses, welding inspections, non-destructive test data, welding procedures, test schedules and other documentation applicable to the specification and procurement of materials shall be provided in accordance with the requirements of all Sections of the Technical Specification and **VOLUME III, CONTRACT PROVISIONS**.

All deliverables become the property of WSF upon submittal, regardless of WSF's disposition of the deliverables.

## **100.4 ADMINISTRATION**

### **100.4.1 Question and Comment Communications**

Questions or comments which may arise during the performance of the Work concerning the content, intent, or other interpretation of the Technical Specification, or **VOLUME V** of the Contract, or other circumstances which require a response by the WSF Representative and which are not specifically addressed by the Technical Specification, shall be submitted to the WSF Representative in writing. The format shall be in accordance with the requirements of the *CONTACT REPORTS* Article of **VOLUME III, CONTRACT PROVISIONS**. Oral explanations, interpretations, or instructions given by anyone after award of the Contract will not be binding on WSF.

### **100.4.2 Conferences**

Before "Notice of Intent" to participate in Phase II "Technical Proposal" preparation and soon after "Notice to Proceed" with the Phase III Contracts, a Phase II Kick-off Meeting or Project Start-up Conference will be scheduled by the WSF Representative. The

purpose of the conferences is to discuss the Technical and Shipyard Specifications, the Contractor's Master Construction Schedule prepared as described below and any other pertinent items that will result in better job understanding.

The Contractor's Design and Construction Manager(s) assigned to the Vessel shall attend the conferences. WSF will provide the appropriate WSF personnel for the conferences.

WSF will host the Phase II Kick-off Meeting in WSF provided facilities. The Contractor shall provide room for the Phase III Project Start-up Conference of adequate size to accommodate ten (10) to fifteen (15) WSF personnel and as many Contractor personnel as considered necessary by the Contractor.

### 100.4.3 Specification and Schedule Compliance

At any time the Contractor anticipates difficulty in meeting the Technical and Shipyard Specification requirements and/or Contract Schedule dates, the Contractor shall immediately notify the WSF Representative verbally, and within twenty-four (24) hours, follow up with a letter stating pertinent details. Receipt of this notification letter **shall not** to be construed as waiver of the Contract requirements and/or schedule.

### 100.4.4 Administrative Plans

In addition to the requirements of the Contract and other Sections of the Outline and Shipyard Specifications, the Contractor shall include the following elements in developing various administrative plans during Phase III Detail Design and Construction phase of the Contract.

All Plans shall designate a primary and secondary member of the Contractor's staff to be the person in charge by name, position, work phone number and twenty-four (24) hour emergency after work phone number. A person so designated shall have **final authority** and **decision-making** responsibilities for the accomplishment of the actions outlined by the specific plan.

The Contractor shall notify the WSF Representative, in writing, within twenty-four (24) hours of any change in designated personnel within any of the Contractor's Plans or organizations.

#### 100.4.4.1 Health, Safety, and Security Plan (HSSP)

Prior to commencement of construction, erection, or assembly on the building ways, the Contractor shall provide to the WSF Representative a detailed Health, Safety, and Security Plan (HSSP) for review and approval as set forth in this Section and the *HEALTH, SAFETY, SANITATION, SECURITY, AND GENERAL SERVICES* Article of **VOLUME III, CONTRACT PROVISIONS**. The plan shall provide a thorough overview of the Work procedures, methods, equipment,

material, and personnel protective programs that will be used for the Contract Work.

In developing the HSSP, the Contractor shall be guided by all applicable requirements of Federal, State and local jurisdictions' laws, rules, and regulations. OSHA Publication 2268 and the Washington Administrative Code provide additional requirements. Special attention shall be paid to OSHA Publication 2268, Subpart F-General Working Conditions, 1915.91 - *Housekeeping*.

In addition to requirements of Federal, State and local jurisdictions' laws, rules, and regulations, the HSP shall address or include:

1. Personnel assignment by name for Safety Officer, Competent Persons, and safety inspectors. Include copies of certifications in the HSSP.
2. The schedule of the safety training sessions.
3. Copies of all safety notices and instructions the Contractor has issued, including closed space entry and gas freeing procedures.
4. Copies of the forms the Contractor intends to use for posting of entry restrictions for closed spaces, including summary sheet and individual spaces.
5. A method for the Contractor's employees and the WSF Representatives to report safety violations observed.
6. Site cleanliness and waste disposal procedures.
7. A plan for daily emptying of all refuse containers on the Vessel.
8. The plan shall provide for equipment and rigging "pull backs", as a minimum, monthly, or sooner as necessary to remove excessive, unused, and/or tangled hoses, electrical cords, rigging, debris, etc. from the Vessel.

#### **100.4.4.1.1 Security Plan**

Thirty (30) days prior to launch of the hull or major hull sections of the first Vessel, the Contractor shall prepare and submit for review and approval a Security Plan. This plan shall include the procedures and processes the Contractor will put in place for the physical security of the Vessel after launching of the hull or major hull sections.

This plan shall include:

1. Security watch and patrol procedures.
2. Notification instructions for reporting conditions and problems to Contractor personnel, including off-hours contact.
3. A diagram of the Vessel's mooring arrangement and the mooring inspection requirements.
4. Security considerations of sea valves.

**100.4.4.1.2 Heavy Weather Plan**

Thirty (30) days prior to launch of the first Vessel, the Contractor shall prepare and submit for review and approval a Heavy Weather Plan, which shall include but not be limited to the following:

1. A weather monitoring program/schedule tied into the NOAA Weather Service. The Contractor shall provide constant monitoring of weather conditions in order to remain cognizant of any impending adverse weather conditions.
2. A list of Contractor personnel knowledgeable in the Heavy Weather Plan to be available for responding to a crisis twenty-four (24) hours a day until the Vessel is delivered.
3. A mooring plan for normal and adverse weather conditions.
4. Pier side security plan based on damage predictions calculated from the Vessel's surface exposure, weight, draft, and the effects of various wind speed, wind direction, wave height, tides, etc. that may adversely affect the Vessel while in its moored location.
5. A Vessel removal plan based upon adverse weather conditions which meet or exceed the minimum damage predictions as determined above.
6. A tug boat removal plan to tow the Vessel to a pre-determined safe location and means to secure the Vessel out of harms way.
7. The rigging of the Fire Warp for towing at both Ends of the Vessel as specified in the Fire Plan below.
8. An emergency power plan and an emergency fire protection plan based upon the Vessel being away from pier side.
9. An on-board de-watering plan for de-watering of the Vessel, should the Vessel be required to be towed from its normal moored location.
10. The Contractor shall notify the WSF Representative, in writing, within twenty-four (24) hours of any change in personnel within the Contractor's Heavy Weather Plan.

**100.4.4.1.3 Fire Plan**

At least thirty (30) days prior to start of construction at the Contractor's facility, the Contractor shall submit for review and approval, a Fire Plan. The National Fire Protection Association, NFPA 312 *Standard for Fire Protection of Vessels during Construction, Repair and Lay-up*, Reference (100B), shall be observed. The Fire Plan shall include the following elements:

1. The Contractor's personnel responsible for implementation of the approved Fire Plan.

2. The location and capabilities of Contractor-supplied fire fighting equipment, including a diagram of the system to be provided on the Vessel and the location of the shore side equipment, list of the equipment available, connections, and major valves.
3. Detailed procedures to be followed in the event of a shipboard fire.
4. A diagram showing the location of the emergency telephone and dedicated fire and flooding alarm system required by Section 1 of the Outline and Shipyard Specifications.
5. Personnel assignments to fire fighting teams by name and function.
6. A schedule of drills and training associated with fire fighting.
7. The location, capabilities and response time of the local fire department and/or Port Authority fire fighting equipment.
8. Contact information to the local fire fighting community, a schedule of drills and familiarization visits by local fire fighters.
9. The rigging of a Fire Warp at both Ends of the Vessel.
10. A statement that the Fire Plan satisfies all applicable local, State and Federal codes, rules, and regulations.
11. The Contractor's Fire Plan shall not make use of WSF personnel, nor, as described above, shall it rely on the availability or proper operation of the Vessel's fire fighting systems and/or equipment.

#### **100.4.4.1.4 Dewatering Plan**

Thirty (30) days prior to launch of the first Vessel, the Contractor shall prepare and submit for review and approval a Dewatering Plan.

The Dewatering Plan shall include the following elements:

1. A listing of the equipment available, the capacity and the response time.
2. A schedule of the drills and training associated with dewatering.
3. A diagram of the location and assembly of on-hand dewatering equipment.
4. Personnel assignments to dewatering teams by name and function.
5. Contact information to local resources.

#### **100.4.5 Submittals**

Unless otherwise noted herein, all submittals to WSF shall consist of one (1) copy in CD-ROM or DVD-ROM and three (3) printed copies.

## 100.4.6 Master Construction Schedule (MCS)

### 100.4.6.1 General

Within thirty (30) days after execution of the Phase II NTP, submit to WSF for review two paper (2) copies of a Master Construction Schedule (MCS) showing the sequence proposed to accomplish the Phase II Work within the NTP time.

Within sixty (60) days preceding completion of Phase II Technical Proposal stage of the Work, submit to WSF for review two (2) paper copies and one (1) CD-ROM or DVD-ROM media copy of an MCS showing the sequence proposed to accomplish the Phase III Work within the Contract time.

The MCS shall be computer generated and presented in Critical Path Method (CPM) displayed on a GANTT Chart format and shall show critical path, activity dependencies, and float. Tasks shall be limited to not more than thirty (30) day durations and shall identify specific tasks for progressing the Work.

The MCS shall show the proposed start and completion dates for principal elements constituting the Work: engineering, planning, construction, quality control, testing, documentation and procurement. Other major milestones such as Contract award, dry-docking, Dock Trials, Preparatory Sea (Builder's) Trials, Sea Trials, delivery, etc., shall also be shown, as well as the milestones outlined under the "*Milestones*" Subparagraph below in this Section of the Technical Specification.

The MCS shall show key event dates of Work under other Shipyard and Design Agent Contracts, the Propulsion System Integration (PSI) Contractor, and the integration of the Shipyard resources for these Contracts.

All prefabrication and advanced outfitting type Work shall be indicated clearly on the schedule. The location, if other than the Contractor's facility, shall also be noted.

At intervals not exceeding thirty (30) days, submit four (4) paper copies and one (1) CD-ROM or DVD-ROM media copy of the updated Master Construction Schedule to WSF for review and use, showing percentage completion of each item, and any proposed revisions to starting and completion dates, along with explanations for the proposed changes. Tasks (or groups of tasks) on the Master Construction Schedule shall correspond with Pay Items on the Request for Payment, so that progress payment requests can be verified. Conduct a meeting with WSF to review the Master Construction Schedule at the time each update is submitted. Progress payments **will not** be made until the complete updated Master Construction Schedule has been received by the WSF Representative.

If at any time during the Work, WSF questions the rate of progress, it will notify the Contractor in writing, who within five (5) days shall submit an update of the Master Construction Schedule for WSF review. The Contractor and WSF at the review meeting shall set the frequency for the subsequent updates of the Master Construction Schedule.

Review of the schedule by WSF shall not relieve the Contractor of his responsibility to adjust his workforce, equipment, or Work as necessary to ensure completion of the Work within the prescribed Contract time.

#### **100.4.6.2 Milestones**

Each Vessel is due to be delivered under a schedule coordinated with the remainder of the WSF Fleet. Consequently, it is of utmost importance that the Vessel be completed as required by this Contract to permit service as scheduled.

For delivery of the Vessel and coordination with other contractors, the Contractor shall determine milestones and include them in his Master Construction Schedule. Milestones shall at a minimum include the following (**Major Milestones are shown in bold type**):

- Notice to Proceed.
- **Complete structural design (first Vessel only).**
- Approval to start construction.
- Keel laying.
- **Delivery of Main Propulsion systems to the Work.**
- Start block outfitting.
- Complete landing Main Diesel Engines
- Complete landing Reduction Gears
- Complete landing EOS Consoles and cabinets in EOS
- Complete landing Ship Service Switchboard
- Complete landing Ship Service Diesel Generators
- Complete all hull interior paint and coating systems.
- Hull completion.
- Complete installation and alignment of High Speed Shafting
- Complete installation of Propeller shafting
- Complete installation of CPP System and Propellers
- Complete Propeller Shaft alignment.

- 1 • Complete installation and alignment of Steering Machinery.
- 2 • Complete installation and alignment of Rudders
- 3 • Complete landing of Pilothouse Consoles.
- 4 • Complete landing Emergency Diesel Generators
- 5 • Complete installation of all exhaust piping and silencers.
- 6 • **Complete installation of Main Propulsion equipment.**
- 7 • Complete all superstructure interior paint and coating systems
- 8 • Superstructure completion.
- 9 • Complete superstructure load-out to hull.
- 10 • Complete landing of power and lighting transformers.
- 11 • Complete landing electrical Motor Control Centers.
- 12 • Complete all electrical cable installation and banding in wireways
- 13 • Complete all watertight integrity inspections below the Lower Vehicle
- 14 Deck
- 15 • **Launching.**
- 16 • Complete installation of Radars, Radios and all other Navigation
- 17 equipment.
- 18 • Complete all structural fire protection, thermal insulation, acoustic
- 19 treatment and lagging.
- 20 • Complete Electrical Cable Resistance and Continuity Testing
- 21 • Connect shore power to the Ships Service and Emergency Switchboards
- 22 • Provide power and control of all ships lighting systems.
- 23 • Provide power and control of all HVAC systems
- 24 • Propulsion System light off.
- 25 • Final Dry-docking
- 26 • Complete exterior paint and coating systems on or above the Lower
- 27 Vehicle Deck
- 28 • Complete exterior hull paint and coating systems
- 29 • Complete all auxiliary machinery and propulsion system test memoranda
- 30 • Complete outfitting.
- 31 • Complete interior Passenger space furniture and décor installation
- 32 • **Dock Trials.**

- Preparatory Sea Trials
- **Sea Trials.**
- Complete Compartment close-outs.
- **Delivery of the Vessel to WSF.**
- Delivery of As-Built Drawings and other technical documentation (technical manuals, parts lists, etc.).

## **100.5 SHIPYARD SPECIFICATION**

Proposers shall prepare and provide a Shipyard Specification during the Phase II Technical Proposal of Work in a MARAD format similar to the Technical Specification which, when used in conjunction with the Phase II Technical Proposal Drawings, shall fully describe the Work to be performed during the Phase III Detail Design and Construction stage of Work. The level of detail of the Shipyard Specification shall be such that the Contractor or any other reasonable Contractor could rely on them to construct the Vessel even if the Contractor had not prepared them. The Shipyard Specification shall contain prescriptive descriptions of the Work and related machinery, equipment, and systems to be supplied. In addition, the Shipyard Specification shall, in a similar format to the Technical Specification, restate all functional and performance requirements related to this Work, and its related machinery, equipment, and systems. The Technical Specification shall be supplemented by additional functional and performance details and requirements identified by the Contractor.

**NOTE:** All material and equipment shall be specifically identified in the Shipyard Specification as to manufacturer, model number or part number, style, color, rating and the like to make it possible for WSF to clearly identify the specific material. An entry including an “or equal” **will not** be acceptable. All material which may become no longer commercially available during the life of the Contract shall be subject to the requirements as set forth in **VOLUME III ~ CONTRACT PROVISIONS** as to “OR EQUAL”.

Each Proposer shall submit for WSF review a draft Shipyard Specification within sixty (60) days of Phase II Technical Proposal Contract award followed by monthly updates for the duration of Phase II Technical Proposal Contract period. Each submittal shall consist of four (4) paper copies and one (1) CD-ROM or DVD-ROM media copy.

Unless approved in writing by the WSF Representative, the requirements of the Technical Specification shall take precedence over the Shipyard Specification. Any proposed departure from those requirements in the Technical Specification shall be clearly noted in a separate document submitted with the Shipyard Specification submittals and updates. Once approved by the WSF Representative, the Shipyard Specification forms a part of this Contract as set forth in **VOLUME III ~ CONTRACT PROVISIONS**.

## **100.6 PURCHASE TECHNICAL SPECIFICATION**

Proposers' shall prepare, append, and provide detailed Purchase Technical Specifications (PTS) during the Phase II Technical Proposal stage of the Work. A PTS shall be provided for all high value machinery and equipment with a purchase value of over \$5,000 (USD). The following purchase requirements, as applicable, shall be included in Purchase Technical Specifications:

- A. Make, model number and/or other information describing the basic item to be supplied.
- B. Special design requirements as may relate to size, material specification, capacity, service rating and other salient characteristics.
- C. Alternative features and optional ancillary equipment to be supplied.
- D. Material certification requirements as addressed in all Sections of the Technical Specification and **VOLUME III, CONTRACT PROVISIONS**.
- E. Shop testing requirements.
- F. Performance test data requirements.
- G. Spare parts and special tools requirements.
- H. Requirements for factory-installed test fittings and appliances needed to accomplish operational tests after installation.
- I. Required attendance of manufacturers' representatives during installation tests and dockside and underway Trials.
- J. Quantity, packaging, delivery and warranty requirements.

During Phase III Detail Design and Construction Contract, the Contractor shall submit one (1) copy of **all** Purchase Orders issued under this Contract, to the WSF Representative within twenty-four (24) hours of issue, including all attachments, such as the PTS, drawings, catalog sheets, etc., and any subsequent Purchase Order revisions.

Three (3) prints of each vendor drawing or literature shall be delivered to the WSF Representative within 24 hours of the date the equipment is delivered to the Contractor. All prints and literature shall indicate only the specific equipment supplied to WSF by the Contractor.

Copies of all correspondence and technical data regarding design features of vendor items shall be furnished along with the submittal of the drawings showing these items.

## **100.7 SCHEDULE OF DRAWINGS**

### **100.7.1 Required Drawings**

Phase II Proposers, and the Phase III Contractor, as applicable, shall design and produce the following Phase II Technical Proposal Drawings and Phase III Detail Design and

Construction Drawings, as a minimum, to accomplish the design Work of this Contract. The drawing numbers and titles shall be used as set forth below. Supplemental drawings shall be provided, if found necessary by the Contractor and/or WSF Representative to support the Shipyard's *unique* design, procurement and construction processes, and selected vendors and sub-contractors. These supplemental drawings shall be provided at no additional cost to WSF and without compromising Contract schedules. The same numbering scheme and title format shall be observed for supplemental drawings.

#### **100.7.1.1 Phase II Technical Proposal Drawings**

Each Proposer shall design and produce the following Technical Proposal Drawings, as a minimum, to demonstrate his understanding of the required Work under this Contract. The drawing numbers and titles shall be used as set forth below.

<b>DWG NUMBER</b>	<b>DRAWING TITLE</b>
9000-001-01	OUTBOARD PROFILE
9000-001-02	INBOARD PROFILE AND CASINGS
9000-001-03	HOLD PLAN AND FLATS ARRANGEMENT
9000-001-04	UPPER AND LOWER VEHICLE DECK ARRANGEMENT
9000-001-05	PASSENGER DECK AND SUN DECK ARRANGEMENT
9000-001-06	PILOTHOUSE, NAVIGATION BRIDGE DECK AND HOUSE TOP ARRANGEMENT
9000-001-07	LINES AND OFFSETS
9000-001-08	FLOODABLE LENGTH CURVES
9000-001-09	PRELIMINARY INTACT TRIM AND STABILITY BOOKLET
9000-001-10	PRELIMINARY FIRE ZONE DIAGRAM
9000-001-11	PRELIMINARY WEIGHT ESTIMATE
9000-001-12	DOCKING INTERFACE
9000-001-13	GRAPHIC STUDIES

1	9000-001-14	PRELIMINARY CAPACITY PLAN
2	9000-002-01	MIDSHIP AND TYPICAL SECTIONS
3	9000-002-02	PRELIMINARY SCANTLING PLAN
4	9000-011-01	VENTS, SOUNDING TUBES, AND OVERFLOWS
5		PIPING DIAGRAM
6	9000-011-03	SANITARY, INTERIOR DRAINS, AND VENTS
7		SYSTEM PIPING DIAGRAM
8	9000-011-05	WEATHER DECK DRAINS PIPING DIAGRAM
9	9000-011-07	BILGE SYSTEM PIPING DIAGRAM
10	9000-012-01	VENTILATION SYSTEM DIAGRAM
11	9000-050-01	MACHINERY AND EOS FLAT ARRANGEMENT
12	9000-053-01	PROPULSION SHAFTING, BEARINGS, AND
13		PROPELLERS ARRANGEMENT
14	9000-053-02	SHAFTING REMOVAL - ARRANGEMENTS &
15		DETAILS
16	9000-056-01	FUEL OIL FILL, OVERFLOW, AND TRANSFER
17		SYSTEM PIPING DIAGRAM
18	9000-057-01	LUBE OIL FILL, SERVICE, AND TRANSFER
19		SYSTEM PIPING DIAGRAM
20	9000-057-02	USED OIL TRANSFER SYSTEM PIPING
21		DIAGRAM
22	9000-058-01	FIREMAIN AND SPRINKLER SYSTEM PIPING
23		DIAGRAM
24	9000-059-01	MACHINERY FRESH WATER COOLING SYSTEM
25		PIPING DIAGRAM
26	9000-059-03	FRESH WATER HEAT RECOVERY SYSTEM
27		PIPING DIAGRAM
28	9000-059-05	FRESH WATER FLUSHING SYSTEM PIPING
29		DIAGRAM

1	9000-059-07	POTABLE WATER FILL AND TRANSFER
2		SYSTEM PIPING DIAGRAM
3	9000-059-09	JACKET WATER HOLDING AND TRANSFER
4		SYSTEM PIPING DIAGRAM
5	9000-059-10	PRELIMINARY GRID COOLER REFLECTED
6		HULL PLAN
7	9000-060-01	HOT WATER HEATING SYSTEM PIPING
8		DIAGRAM
9	9000-063-01	DIESEL EXHAUST AND OIL-FIRED HOT WATER
10		HEATER UPTAKE DIAGRAM
11	9000-064-01	MACHINERY SPACE AND EOS AREA HVAC
12		SYSTEM DIAGRAM
13	9000-065-01	AIR CONDITIONING REFRIGERATING SYSTEM
14		DIAGRAM
15	9000-065-02	HVAC CONTROL SYSTEM DIAGRAM
16	9000-070-02	SEWAGE TRANSFER SYSTEM PIPING DIAGRAM
17	9000-072-01	SHIP'S SERVICE COMPRESSED AIR SYSTEM
18		PIPING DIAGRAM
19	9000-081-01	PRELIMINARY STEERING GEAR ROOM
20		ARRANGEMENT
21	9000-087-01	PRELIMINARY ELECTRICAL LOAD ANALYSIS
22	9000-087-03	PRELIMINARY FAULT CURRENT ANALYSIS
23	9000-087-04	PRELIMINARY CIRCUIT BREAKER
24		COORDINATION STUDY
25	9000-087-05	ELECTRICAL EQUIPMENT ARRANGEMENT
26	9000-090-01	ELECTRICAL ONE-LINE DIAGRAM
27	9000-090-02	PROPULSION SYSTEM - POWER DISTRIBUTION
28		& CONTROL BLOCK DIAGRAM
29	9000-095-01	PUBLIC ADDRESS SYSTEM INSTALLATION
30		BLOCK DIAGRAM

1	9000-095-02	GENERAL ALARM SYSTEM INSTALLATION
2		BLOCK DIAGRAM
3	9000-095-03	SHIP'S DIAL TELEPHONE ELEMENTARY BLOCK
4		DIAGRAM
5	9000-095-07	CIRCUIT "FR" ELEMENTARY BLOCK DIAGRAM
6	9000-095-08	STEERING GEAR ALARM SYSTEM BLOCK
7		DIAGRAM
8	9000-095-11	SOUND POWERED PHONES INSTALLATION
9		AND ELEMENTARY BLOCK DIAGRAM
10	9000-095-12	AIR CONDITIONING AND VENT SYSTEM
11		CONTROL & SHUTDOWN BLOCK DIAGRAM
12	9000-095-13	ENGINEER'S AUXILIARY SYSTEMS ALARM &
13		MONITORING SYSTEM BLOCK DIAGRAM
14	9000-095-17	FIRE DETECTION AND ALARM SYSTEM BLOCK
15		DIAGRAM

#### 16 **100.7.1.2 Phase III Detail Design and Construction Drawings**

17 The successful Contractor shall design and produce the following Engineering  
 18 and Working Drawings, as a minimum, for the required Work under this Contract.  
 19 The drawing numbers and titles shall be used as set forth below.

20 **NOTE:** The following list is for the first Vessel of this Contract only. Each  
 21 follow-on Vessel under this Contract shall have its own set of the  
 22 below drawings prepared and provided reflecting the same drawing  
 23 titles and drawing numbers modified to suit the unique WSF Vessel  
 24 number in the drawing number (i.e. "9002", "9003", "9004" as  
 25 applicable).

26	<b>DWG NUMBER</b>	<b>DRAWING TITLE</b>
27	9001-001-01	OUTBOARD PROFILE
28	9001-001-02	INBOARD PROFILE AND CASINGS
29	9001-001-03	HOLD PLAN AND FLATS ARRANGEMENT
30	9001-001-04	UPPER AND LOWER VEHICLE DECK
31		ARRANGEMENT

1	9001-001-05	PASSENGER DECK AND SUN DECK
2		ARRANGEMENT
3	9001-001-06	PILOTHOUSE, NAVIGATION BRIDGE DECK,
4		AND HOUSETOP ARRANGEMENT
5	9001-001-07	LINES AND OFFSETS
6	9001-001-08	FLOODABLE LENGTH CURVES
7	9001-001-09	INTACT TRIM AND STABILITY BOOKLET
8	9001-001-10	FIRE ZONE DIAGRAM
9	9001-001-11	DOCKING INTERFACES
10	9001-001-12	WEIGHTS & CENTERS CALCULATIONS
11	9001-001-13	GRAPHIC STUDIES
12	9001-001-14	CAPACITY PLAN
13	9001-001-15	CONTRACTOR'S WEIGHT ESTIMATE
14	9001-001-16	DOCKING AND UNDERWATER SURVEY PLAN
15	9001-001-17	LAUNCHING PLAN
16	9001-001-18	LAUNCHING CALCULATIONS BOOKLET
17	9001-001-19	MUSTER STATIONS AND EMERGENCY ESCAPE
18		PLAN
19	9001-001-20	FIRE CONTROL PLAN
20	9001-002-01	MIDSHIP SECTION
21	9001-002-02	SHELL EXPANSION
22	9001-002-03	CVK AND LONGITUDINAL GIRDERS IN
23	BOTTOM	
24	9001-002-04	SUCTION SEA CHESTS
25	9001-002-05	TANK TOP PLATING, MISCELLANEOUS FLATS,
26		AND BULKHEADS - BELOW LOWER VEHICLE
27		DECK

1	9001-002-06	WEB FRAMES, FLOORS, AND STANCHIONS -
2		BELOW LOWER VEHICLE DECK
3	9001-002-07	ORDINARY FRAMES
4	9001-002-08	SIDE STRINGERS, GIRDERS, AND
5		LONGITUDINAL BULKHEADS - BELOW THE
6		LOWER VEHICLE DECK
7	9001-002-09	BOW FRAMING
8	9001-002-10	WATERTIGHT AND OIL TIGHT TRANSVERSE
9		BULKHEADS
10	9001-002-11	NON-STRUCTURAL AND MISCELLANEOUS
11		BULKHEADS
12	9001-002-12	MAIN PROPULSION MACHINERY
13		FOUNDATIONS
14	9001-002-13	SSDG AND EMERGENCY DIESEL GENERATOR
15		ENGINE FOUNDATIONS
16	9001-002-14	MACHINERY FOUNDATIONS
17	9001-002-15	MISCELLANEOUS FOUNDATIONS
18	9001-002-16	PLATING, BEAMS AND GIRDERS - LOWER
19		VEHICLE DECK
20	9001-002-17	RUDDER HORN, RUDDER, AND STOCK
21	9001-002-18	STERN FRAME AND STERN TUBE
22	9001-002-19	WELDING SCHEDULE
23	9001-002-20	STRUCTURAL NOTES & DETAILS
24	9001-003-01	CURTAIN PLATING
25	9001-003-02	UPPER & LOWER VEHICLE DECK - PLATING,
26		BEAMS AND GIRDERS
27	9001-003-03	UPPER & LOWER VEHICLE DECK -
28		MISCELLANEOUS BULKHEADS AND GIRDERS
29	9001-003-04	CASING PLATING - WEBS AND STIFFENING

1	9001-003-05	PASSENGER DECK - PLATING, BEAMS, WEBS,
2		AND GIRDERS
3	9001-003-06	PASSENGER DECK HOUSE - SIDES AND ENDS
4	9001-003-07	PASSENGER DECK - INTERIOR BULKHEADS
5	9001-003-08	SUN DECK - PLATING, BEAMS AND GIRDERS
6	9001-003-09	SUN DECK MIDSHIP HOUSE - PLATING, BEAMS,
7		HOUSE SIDES AND INTERIOR BULKHEADS
8	9001-003-10	SUN DECK END HOUSES - PLATING, BEAMS,
9		SIDES AND INTERIOR BULKHEADS
10	9001-003-11	PILOTHOUSES - PLATING, BEAMS AND HOUSE
11		SIDES
12	9001-003-12	FUNNEL
13	9001-004-01	NON-WATERTIGHT DOOR SCHEDULE
14	9001-004-02	WATERTIGHT DOORS, HATCHES, SCUTTLES,
15		MANHOLES, AND CLOSURES SCHEDULE
16	9001-004--03	SLIDING WATERTIGHT DOORS AND
17		HYDRAULIC PIPING - ARRANGEMENT &
18		DETAILS
19	9001-005-01	STAIRWAYS, LOWER VEHICLE DECK TO
20		PASSENGER DECK - ARRANGEMENT &
21		DETAILS
22	9001-005-02	STAIRWAYS, INCLINED LADDERS AND
23		HANDRAILS - ARRANGEMENT & DETAILS
24	9001-005-03	VERTICAL LADDERS, AND RUNGS -
25		ARRANGEMENT & DETAILS
26	9001-005-04	MISCELLANEOUS HANDRAILS, STANCHIONS,
27		LIFELINES, AND GATES; LOWER VEHICLE
28		DECK & ABOVE - ARRANGEMENT & DETAILS
29	9001-005-05	WINDOW SCHEDULE & DETAILS
30	9001-005-06	HORIZONTAL ROLLING PASSENGER
31		EMBARKATION GATES

1	9001-005-07	EXTERIOR HANDRAILS AND STANCHIONS -
2		ARRANGEMENT & DETAILS
3	9001-005-08	MOORING ARRANGEMENT
4	9001-006-01	DECK COVERING SCHEDULE
5	9001-007-01	STRUCTURAL AND THERMAL INSULATION
6		SCHEDULE & DETAILS
7	9001-007-02	ACOUSTICAL INSULATION SCHEDULE &
8		DETAILS
9	9001-007-03	ENGINEERS OPERATING STATION
10		ACOUSTICAL ANALYSIS
11	9001-007-04	SHEET METAL SHEATHING - ARRANGEMENT &
12		DETAILS
13	9001-008-01	MASTS AND POINTERS - ARRANGEMENT &
14		DETAILS
15	9001-009-01	RIGGING - ARRANGEMENT & DETAILS
16	9001-010-01	ANCHOR HANDLING - ARRANGEMENTS &
17		DETAILS
18	9001-011-01	VENTS, SOUNDING TUBES, AND OVERFLOWS
19		PIPING DIAGRAM
20	9001-011-02	VENTS, SOUNDING TUBES, AND OVERFLOWS
21		PIPING - ARRANGEMENT & DETAILS
22	9001-011-03	SANITARY & INTERIOR DRAINS, AND VENTS
23		SYSTEM PIPING DIAGRAM
24	9001-011-04	SANITARY & INTERIOR DRAINS, AND VENTS
25		SYSTEM PIPING - ARRANGEMENT & DETAILS
26	9001-011-05	WEATHER DECK DRAINS PIPING DIAGRAM
27	9001-011-06	WEATHER DECK DRAINS PIPING -
28		ARRANGEMENT & DETAILS
29	9001-011-07	BILGE SYSTEM PIPING DIAGRAM

1	9001-011-08	BILGE SYSTEM PIPING - ARRANGEMENT &
2		DETAILS
3	9001-011-09	HATCH AND MISCELLANEOUS DRAIN PIPING -
4		ARRANGEMENT & DETAILS
5	9001-012-01	VENTILATION SYSTEM DIAGRAM
6	9001-012-02	VENTILATION CALCULATIONS
7	9001-012-03	VENTILATION SYSTEM, PASSENGER DECK AND
8		ABOVE - ARRANGEMENT & DETAILS
9	9001-012-04	VENTILATION SYSTEM, PASSENGER DECK AND
10		BELOW - ARRANGEMENT & DETAILS
11	9001-012-05	VENTILATION SYSTEM, VOIDS AND STEERING
12		GEAR COMPTS - ARRANGEMENT & DETAILS
13	9001-012-06	VENTILATION ACOUSTICAL CALCULATIONS
14	9001-012-07	AIR CONDITIONING AND VENTILATION
15		CONTROL SYSTEM DIAGRAM
16	9001-012-08	AIR CONDITIONING AND VENTILATION
17		CONTROL SYSTEM INSTALLATION -
18		ARRANGEMENT & DETAILS
19	9001-012-09	EMERGENCY DIESEL GENERATOR ROOM
20		VENTILATION - ARRANGEMENT & DETAILS
21	9001-012-10	SUN DECK FAN ROOMS 1 & 2 - ARRANGEMENT
22		& DETAILS
23	9001-012-11	SUN DECK FAN ROOMS 3 & 4 - ARRANGEMENT
24		& DETAILS
25	9001-013-01	HI-FOG FIRE EXTINGUISHING SYSTEM PIPING
26		DIAGRAMMATIC ARRANGEMENT
27	9001-013-02	ENGINE ROOMS, EMERGENCY DIESEL
28		GENERATOR ROOM, AND PAINT LOCKER
29		FIXED HI-FOG FIRE EXTINGUISHING SYSTEM -
30		ARRANGEMENT & DETAILS

1	9001-013-03	SEMI-PORTABLE CO <sub>2</sub> HOSE REEL FIRE
2		EXTINGUISHING SYSTEM - ARRANGEMENT &
3		DETAILS
4	9001-013-04	PORTABLE FIRE EXTINGUISHING EQUIPMENT -
5		ARRANGEMENT & DETAILS
6	9001-014-01	PAINT SCHEDULE
7	9001-014-02	VEHICLE DECK MARKINGS AND COLOR
8		SCHEME DIAGRAM
9	9001-016-01	LIFE SAVING EQUIPMENT AND STOWAGE -
10		ARRANGEMENT & DETAILS
11	9001-016-02	RESCUE BOAT, MOORING AND ANCHOR
12		HANDLING - ARRANGEMENT & DETAILS
13	9001-016-03	HIGH SLIDE MARINE EVACUATION SYSTEM
14		(MES) - ARRANGEMENT AND DETAILS
15	9001-016-04	LIFESAVING PLAN
16	9001-017-01	FOOD VENDING AREAS EQUIPMENT -
17		SCHEDULE, ARRANGEMENT & DETAILS
18	9001-018-01	STORE ROOMS - ARRANGEMENT & DETAILS
19	9001-018-02	MISCELLANEOUS LOCKERS - ARRANGEMENT
20		& DETAILS
21	9001-019-01	FURNITURE SCHEDULE
22	9001-019-02	SUN DECK FURNITURE AND FURNISHINGS -
23		ARRANGEMENT, FOUNDATIONS & DETAILS
24	9001-019-03	PASSENGER DECK FURNITURE AND
25		FURNISHINGS - ARRANGEMENT,
26		FOUNDATIONS & DETAILS
27	9001-019-04	PILOTHOUSE FURNITURE AND FURNISHINGS -
28		ARRANGEMENT, FOUNDATIONS & DETAILS
29	9001-019-05	DECK CREW SHELTER FURNITURE AND
30		FURNISHINGS - ARRANGEMENT,
31		FOUNDATIONS & DETAILS

1	9001-019-06	ENGINEERS' OPERATING STATION AND DAY
2		ROOM FURNITURE AND FURNISHINGS -
3		ARRANGEMENT, FOUNDATIONS & DETAILS
4	9001-020-01	SANITARY FIXTURES & ACCESSORIES
5		SCHEDULE
6	9001-020-02	MEN'S RESTROOM - ARRANGEMENT &
7		DETAILS
8	9001-020-03	WOMEN'S RESTROOM - ARRANGEMENT &
9		DETAILS
10	9001-020-04	UNISEX RESTROOMS - ARRANGEMENT &
11		DETAILS
12	9001-020-05	CREW AND ENGINEERS' RESTROOMS -
13		ARRANGEMENT & DETAILS
14	9001-021-01	KEY AND LOCK LIST
15	9001-023-01	PASSENGER ELEVATORS - STRUCTURAL
16		DETAILS
17	9001-023-02	PASSENGER ELEVATORS - ELECTRICAL
18		DETAILS
19	9001-023-03	PASSENGER ELEVATORS HYDRAULIC SYSTEM
20		PIPING - ARRANGEMENT & DETAILS
21	9001-023-04	PASSENGER ELEVATORS, MACHINERY ROOM
22		ENCLOSURE & FOUNDATION - ARRANGEMENT
23		& DETAILS
24	9001-024-01	NOTICES, NAMEPLATES AND MARKINGS -
25		ARRANGEMENT & DETAILS
26	9001-024-02	HEATING, VENTILATION, AND AIR
27		CONDITIONING SYSTEMS LABEL PLATES LIST
28	9001-024-03	MECHANICAL SYSTEMS LABEL PLATES LIST
29	9001-024-04	ELECTRICAL SYSTEMS LABEL PLATES LIST
30	9001-024-05	UPPER AND LOWER VEHICLE DECK SAFETY
31		MARKINGS AND DECK STRIPES

1	9001-025-01	JOINER DETAILS
2	9001-025-02	JOINER BULKHEAD AND LININGS
3		ARRANGEMENTS - SUN DECK & ABOVE
4	9001-025-03	JOINER BULKHEAD AND LININGS
5		ARRANGEMENTS - PASSENGER DECK
6	9001-025-04	JOINER BULKHEAD AND LININGS
7		ARRANGEMENTS - BELOW PASSENGER DECK
8	9001-025-05	JOINER BULKHEAD AND LININGS
9		ARRANGEMENTS - ENGINEERS' OPERATING
10		STATION AND DAY ROOM
11	9001-025-06	JOINER BULKHEAD AND LININGS - FOOD
12		VENDING AREA
13	9001-025-07	REFLECTED CEILING DECK PLAN - SUN DECK
14		& ABOVE
15	9001-025-08	REFLECTED CEILING DECK PLAN - PASSENGER
16		DECK
17	9001-025-09	REFLECTED CEILING DECK PLAN - BELOW
18		PASSENGER DECK
19	9001-050-01	MACHINERY AND EOS FLAT ARRANGEMENTS
20	9001-050-02	EMERGENCY DIESEL GENERATOR ROOM
21		ARRANGEMENT
22	9001-050-03	MISCELLANEOUS MACHINERY SPACES
23		ARRANGEMENTS
24	9001-051-01	MACHINERY LIFTING GEAR - ARRANGEMENT
25		& DETAILS
26	9001-051-02	MAIN PROPULSION ENGINE SKID AND
27		MOUNTING - ARRANGEMENT & DETAILS
28	9001-053-01	PROPULSION SHAFTING, BEARINGS,
29		PROPELLERS - ARRANGEMENT & DETAILS
30	9000-053-02	SHAFTING REMOVAL - ARRANGEMENTS &
31		DETAILS

1	9001-053-03	PROPELLER SHAFT ALIGNMENT ANALYSIS
2	9001-053-04	LIFTING PADS & STAPLES FOR PROPELLERS
3		AND RUDDERS
4	9001-056-01	FUEL OIL FILL, OVERFLOW, AND TRANSFER
5		SYSTEM PIPING DIAGRAM
6	9001-056-02	FUEL OIL FILL, OVERFLOW, AND TRANSFER
7		SYSTEM PIPING - ARRANGEMENT & DETAILS
8	9001-057-01	LUBE OIL FILL, SERVICE AND TRANSFER
9		SYSTEMS PIPING DIAGRAM
10	9001-057-02	LUBE OIL FILL, SERVICE AND TRANSFER
11		SYSTEMS PIPING - ARRANGEMENT & DETAILS
12	9001-057-03	USED OIL TRANSFER SYSTEM PIPING
13		DIAGRAM
14	9001-057-04	USED OIL TRANSFER SYSTEM PIPING -
15		ARRANGEMENT & DETAILS
16	9001-057-05	STERN TUBE BEARING LUBE OIL SYSTEM
17		PIPING DIAGRAM
18	9001-057-06	STERN TUBE BEARING LUBE OIL SYSTEM
19		PIPING - ARRANGEMENT & DETAILS
20	9001-058-01	FIREMAIN AND SPRINKLER SYSTEM PIPING
21		DIAGRAM
22	9001-058-02	FIREMAIN AND SPRINKLER SYSTEM PIPING -
23		ARRANGEMENT & DETAILS
24	9001-058-03	FIRE STATIONS - ARRANGEMENT & DETAILS
25	9001-059-01	MACHINERY FRESH WATER COOLING SYSTEM
26		PIPING DIAGRAM
27	9001-059-02	MACHINERY FRESH WATER COOLING SYSTEM
28		PIPING - ARRANGEMENT & DETAILS
29	9001-059-03	FRESH WATER HEAT RECOVERY SYSTEM
30		PIPING DIAGRAM

1	9001-059-04	FRESH WATER HEAT RECOVERY SYSTEM
2		PIPING - ARRANGEMENT & DETAILS
3	9001-059-05	FRESH WATER FLUSHING SYSTEM PIPING
4		DIAGRAM
5	9001-059-06	FRESH WATER FLUSHING SYSTEM PIPING -
6		ARRANGEMENT & DETAILS
7	9001-059-07	POTABLE WATER FILL AND TRANSFER
8		SYSTEM PIPING DIAGRAM
9	9001-059-08	POTABLE WATER FILL AND TRANSFER
10		SYSTEM PIPING - ARRANGEMENT & DETAILS
11	9001-059-09	JACKET WATER SYSTEM PIPING -
12		ARRANGEMENT & DETAILS
13	9001-059-10	GRID COOLER REFLECTED HULL PLAN
14	9001-060-01	HOT WATER HEATING SYSTEM PIPING
15		DIAGRAM
16	9001-060-02	HOT WATER HEATING SYSTEM PIPING -
17		ARRANGEMENT & DETAILS
18	9001-063-01	DIESEL EXHAUST AND OIL-FIRED HOT WATER
19		HEATER UPTAKES DIAGRAM
20	9001-063-02	MAIN ENGINE EXHAUST AND CRANKCASE
21		VENT SYSTEM - ARRANGEMENT & DETAILS
22	9001-063-03	SHIPS SERVICE AND EMERGENCY DIESEL
23		GENERATORS EXHAUST - ARRANGEMENT &
24		DETAILS
25	9001-063-04	OIL-FIRED HOT WATER HEATER UPTAKE
26		SYSTEM - ARRANGEMENT & DETAILS
27	9001-064-01	ENGINE ROOMS AND EOS AREAS HVAC
28		SYSTEMS DIAGRAM
29	9001-064-02	ENGINE ROOMS AND EOS AREAS HVAC
30		SYSTEMS - ARRANGEMENT & DETAILS
31	9001-064-03	ENGINE ROOMS VENT FILTER/PLENUM BOX -
32		ARRANGEMENT & DETAILS

1	9001-065-01	AIR CONDITIONING REFRIGERATING SYSTEM
2		DIAGRAM
3	9000-065-02	HVAC CONTROL DIAGRAM
4	9001-065-03	AIR CONDITIONING REFRIGERATING SYSTEM -
5		ARRANGEMENT & DETAILS
6	9001-070-01	FUEL OIL FILL/LUBE OIL FILL/VENT AND
7		CONTAINMENT STATIONS - ARRANGEMENT &
8		DETAILS
9	9001-070-02	SEWAGE HOLDING AND TRANSFER SYSTEM
10		PIPING DIAGRAM
11	9001-070-03	SEWAGE HOLDING AND TRANSFER SYSTEM
12		PIPING - ARRANGEMENT & DETAILS
13	9001-071-01	TANK LEVEL INDICATOR SYSTEM SCHEMATIC
14		DIAGRAM
15	9001-071-02	TANK LEVEL INDICATOR SYSTEM
16		INSTALLATION - ARRANGEMENT & DETAILS
17	9001-071-03	TANK AND VOID SOUNDING TABLES BOOKLET
18	9001-072-01	SHIP'S SERVICE COMPRESSED AIR SYSTEM
19		PIPING DIAGRAM
20	9001-072-02	SHIP'S SERVICE COMPRESSED AIR SYSTEM -
21		ARRANGEMENT & DETAILS
22	9001-074-01	VALVE OPERATING GEAR KEY PLAN -
23		ARRANGEMENT & DETAILS
24	9001-074-02	MISCELLANEOUS PIPING DETAILS
25	9001-075-01	MACHINERY AND PIPING INSULATION &
26		LAGGING SCHEDULE
27	9001-078-01	MISCELLANEOUS TANKS - ARRANGEMENT &
28		DETAILS
29	9001-078-02	TANK CAPACITY CURVES
30	9001-078-03	TANK SOUNDING TABLES

1	9001-079-01	LADDERS, GRATING, HANDRAILS, AND FLOOR
2		PLATES, BELOW LOWER VEHICLE DECK -
3		ARRANGEMENT & DETAILS
4	9001-079-02	LADDERS, GRATING, HANDRAILS, AND FLOOR
5		PLATES, LOWER VEHICLE DECK AND ABOVE -
6		ARRANGEMENT & DETAILS
7	9001-080-01	ENGINEER'S WORKSHOP AND STOREROOM -
8		ARRANGEMENT & DETAILS
9	9001-081-01	STEERING GEAR ROOM ARRANGEMENT
10	9001-081-02	STEERING GEAR SYSTEM STRUCTURAL
11		INSTALLATION
12	9001-081-03	STEERING GEAR SYSTEM MECHANICAL
13		INSTALLATION - ARRANGEMENT & DETAILS
14	9001-085-01	LIST OF GAGES, THERMOMETERS AND
15		INSTRUMENTS
16	9001-085-02	MAIN ENGINE GAGE BOARD - ARRANGEMENT
17		& DETAILS
18	9001-085-03	MISCELLANEOUS GAGE BOARD AND NOTICE
19		BOARDS - ARRANGEMENT & DETAILS
20	9001-085-04	GAGE PIPING - ARRANGEMENT & DETAILS
21	9001-087-01	ELECTRICAL LOAD ANALYSIS
22	9001-087-02	VOLTAGE DROP CALCULATIONS
23	9001-087-03	FAULT CURRENT ANALYSIS
24	9001-087-04	CIRCUIT BREAKER COORDINATION STUDY
25	9001-087-05	ELECTRICAL EQUIPMENT INSTALLATION -
26		ARRANGEMENT AND DETAILS
27	9001-087-06	POWER CABLE WIREWAYS - ARRANGEMENT &
28		DETAILS
29	9001-087-07	LOW VOLTAGE WIREWAYS - ARRANGEMENT &
30		DETAILS

1	9001-089-01	MAIN SWITCHBOARD LAYOUT
2	9001-089-02	MAIN SWITCHBOARD INSTALLATION
3	9001-089-03	MAIN SWITCHBOARD - CONTROL WIRING
4		DIAGRAM
5	9001-089-04	EMERGENCY SWITCHBOARD LAYOUT
6	9001-089-05	EMERGENCY SWITCHBOARD INSTALLATION
7	9001-089-06	EMERGENCY SWITCHBOARD - CONTROL
8		WIRING DIAGRAM
9	9001-090-01	ELECTRICAL ONE-LINE DIAGRAM
10	9001-090-02	PROPULSION SYSTEM - POWER DISTRIBUTION
11		& CONTROL WIRING DIAGRAM
12	9001-090-03	POWER DECK PLANS - BELOW LOWER
13		VEHICLE DECK
14	9001-090-04	POWER DECK PLANS - LOWER VEHICLE DECK
15		AND ABOVE
16	9001-090-05	WIREWAY ARRANGEMENT
17	9001-090-06	MULTI-CABLE TRANSIT INSTALLATION -
18		ARRANGEMENT & DETAILS
19	9001-090-07	LIST ELECTRICAL POWER PANELS & PHASE
20		BALANCING CALCULATIONS
21	9001-090-08	RECEPTACLES & ELECTRICAL DISTRIBUTION
22		EQUIPMENT LAYOUT
23	9001-090-09	FOOD PREPARATION AREA POWER DECK
24		PLANS
25	9001-090-10	RESCUE BOAT BATTERY CHARGER SYSTEM
26	9001-091-01	MOTOR CONTROLLER WIRING DIAGRAMS
27		BOOKLET
28	9001-091-02	MOTOR DATA BOOKLET

1	9001-092-01	LIGHTING DECK PLAN - UPPER VEHICLE DECK
2		& BELOW
3	9001-092-02	LIGHTING DECK PLAN - PASSENGER DECK &
4		ABOVE
5	9001-092-03	NAVIGATION LIGHTS & WHISTLE
6		ELEMENTARY WIRING DIAGRAM
7	9001-092-04	NAVIGATION LIGHTS ARRANGEMENT
8	9001-093-01	VHF RADIO INSTALLATION & WIRING
9		DIAGRAM
10	9001-094-01	STEERING SYSTEM CONTROL & RUDDER
11		ANGLE INDICATOR ELEMENTARY WIRING
12		DIAGRAM
13	9001-094-02	RADAR SYSTEM INSTALLATION &
14		ELEMENTARY WIRING DIAGRAM
15	9001-094-03	GYRO COMPASS SYSTEM INSTALLATION &
16		ELEMENTARY WIRING DIAGRAM
17	9001-094-04	ELECTRONIC & COMMUNICATION SYSTEMS
18		EQUIPMENT - ANTENNA ARRANGEMENT
19	9001-095-01	PUBLIC ADDRESS SYSTEM INSTALLATION &
20		ELEMENTARY WIRING DIAGRAM
21	9001-095-02	GENERAL ALARM SYSTEM INSTALLATION
22		WIRING DIAGRAM
23	9001-095-03	SHIP'S DIAL TELEPHONE ELEMENTARY
24		WIRING DIAGRAM
25	9001-095-04	WATERTIGHT DOOR CONTROL SYSTEM
26		ELEMENTARY WIRING DIAGRAM
27	9001-095-05	GLOBAL POSITIONING SYSTEM WIRING
28		DIAGRAM
29	9001-095-06	CIRCUIT "FR" ELEMENTARY WIRING DIAGRAM
30	9001-095-07	STEERING GEAR ALARM SYSTEM
31		ELEMENTARY WIRING DIAGRAM

1	9001-095-08	VHF MARINE RADIO SYSTEM WIRING
2		DIAGRAM
3	9001-095-09	ENGINE ORDER TELEGRAPH POWER FAIL
4		ALARM WIRING DIAGRAM
5	9001-095-10	SOUND POWERED PHONES INSTALLATION
6		AND ELEMENTARY WIRING DIAGRAM
7	9001-095-11	AIR CONDITIONING AND VENT SYSTEM
8		CONTROL & SHUTDOWN ELEMENTARY
9		WIRING DIAGRAM
10	9001-095-12	ENGINEER'S AUXILIARY SYSTEMS ALARM &
11		MONITORING SYSTEM ELEMENTARY WIRING
12		DIAGRAM
13	9001-095-13	SHAFT REVOLUTION INDICATOR SYSTEM
14		INSTALLATION AND ELEMENTARY WIRING
15		DIAGRAM
16	9001-095-14	SLIDING WATERTIGHT DOOR CONTROL
17		SYSTEM WIRING DIAGRAM
18	9001-095-15	FIRE DOOR MAGNETIC HOLDING SYSTEM
19		WIRING DIAGRAM
20	9001-095-16	FIRE DETECTION & ALARM SYSTEM
21	9001-095-17	TANK LEVEL INDICATOR SYSTEM
22		INSTALLATION ELEMENTARY WIRING
23		DIAGRAM
24	9001-095-18	CATHODIC PROTECTION INSTALLATION AND
25		CONNECTION DETAILS & WIRING DIAGRAM
26	9001-095-19	HOMELAND SECURITY IMPLEMENTATION
27		CABLING AND CONNECTION DETAILS &
28		WIRING DIAGRAM
29	9001-095-20	HOMELAND SECURITY PLAN
30	9001-095-21	EARLY WARNING FIRE DETECTION SYSTEM
31		INSTALLATION AND CONNECTION DETAILS &
32		WIRING DIAGRAM

1	9001-095-22	SUPER-LAN/SECURITY &
2		SURVEILLANCE/WIRELESS OVER WATER
3		INSTALLATION AND CONNECTION DETAILS &
4		WIRING DIAGRAM
5	9001-095-23	I.C. SYSTEMS EQUIPMENT LAYOUT
6	9001-096-01	MISC BATTERY & CHARGING SYSTEM
7		INSTALLATION AND CONNECTION DETAILS &
8		WIRING DIAGRAM
9	9001-099-01	PILOTHOUSE CONTROL CONSOLE -
10		ARRANGEMENT & DETAILS
11	9001-099-02	EOS CONTROL CONSOLE ELECTRICAL
12		EQUIPMENT INSTALLATION - ARRANGEMENT
13		& DETAILS
14	9001-100-01	FIRE PROTECTION DISPLAY PLAN

## 15 **100.8 ENGINEERING AND WORKING DRAWINGS**

16 A complete set of Engineering and Working Drawings, Schematics, and deliverables shall be  
17 prepared and provided that include, but are not limited to, those drawings listed above, and  
18 the various drawings listed in the *PHASE II TECHNICAL PROPOSAL REQUIREMENTS* and  
19 *PHASE III DETAIL DESIGN AND CONSTRUCTION REQUIREMENTS* Subsections in each  
20 Section of the Technical Specification. The purposes of these drawings are as follows:

- 21 A. Provide details required for WSF review and determination that the information  
22 displayed is in accordance with the Outline and Shipyard Specifications.
- 23 B. Provide the details required to produce other associated drawings and to allow  
24 Shipyard crafts-persons to procure the proper materials and to perform the required  
25 Work.
- 26 C. Provide the details required to gain Authoritative Agency approval.
- 27 D. Provide a permanent record of the Work that will allow future operating personnel to  
28 understand, troubleshoot, maintain and repair structure or systems displayed.

29 Phase II Technical Proposal Drawings and deliverables shall contain sufficient information  
30 to substantiate the design and confirm compliance with the Outline and Shipyard  
31 Specifications.

32 Phase III Detail Design and Construction Drawings and deliverables shall contain details,  
33 dimensions, sizes and types of materials, erection layouts, and any other information that  
34 may be required for the complete fabrication, construction and prosecution of the Work, and

1 which are not included in the Phase II Technical Proposal Drawings already approved by the  
2 WSF Representative. Workmanship criteria and requirements shall be clearly indicated on  
3 construction and installation drawings to draw workers' attention to these issues.

4 All drawings shall conform to their assigned drawing title and shall be produced to a level of  
5 detail to readily depict all aspects of the entire system(s), structure, arrangements, layouts,  
6 orientation, interferences, and any equipment unique requirements which will convey the  
7 information contained in the drawing in a fashion to be readily understandable to a future  
8 user without the need to go to the Vessel, and as set forth below:

- 9 • An **Engineering Change Notice** (ECN) is a document prepared and approved by the  
10 Contractor and reviewed by WSF that describes and authorizes the Contractor's  
11 intent for implementation of an engineering change to the product and its approved  
12 configuration documentation that allows WSF and the Contractor to establish controls  
13 and manage the process of making changes to documents, calculations, schematics,  
14 diagrams, drawings, parts, and Bill of Materials, as well as routings, work orders, and  
15 tasks. All ECN shall be prepared and incorporated as set forth in the *ENGINEERING*  
16 *& WORKING DRAWINGS AND CALCULATIONS PREPARATION* Subsection in this  
17 Section of the Technical Specification.
- 18 • **Schematic drawings** shall be a type of diagram, which depicts the parts of a system,  
19 by means of graphic symbols that clarifies the relationship between all the parts of a  
20 whole. Schematics shall be concerned with showing system components and their  
21 connecting elements, such as wires, printed circuits, ducts, or pipes. A schematic  
22 shall generally be a stick type diagram representation of connections between  
23 assemblies, panels, equipment, and units of part or the total of a system. A schematic  
24 shall facilitate tracing an electrical, electronic, or mechanical system and its functions  
25 without regard to the actual physical size, shape, or location of the component or part.
- 26 • **System diagrams** shall provide as a stick type representation of connections between  
27 assemblies, panels, equipment, valve and component "line up", and units of part or  
28 the total of a system that gives all of the information necessary for making a single  
29 part, complete machine or structure, or system by means of graphic symbols which  
30 clarify the relationship between the parts of a whole within an accurately drawn  
31 structure. The diagram shall provide specifications for the kinds of materials to be  
32 used, design parameters, the methods of finish, and the accuracy required. A system  
33 diagram presents a higher level of detail and form than a schematic.
- 34 • **System drawings** shall provide all of the information necessary for making a single  
35 part, complete machine or structure, or system as set forth in the drawing title. The  
36 drawing shall completely describe shape, size, equipment, structures, components,  
37 fittings, connections, orientation, interferences, special circumstances, and layout in a  
38 scaled and physically accurate format. The drawing provides a detailed list of  
39 materials identifying all materials to be used and where they are used, special  
40 requirements, the methods of finish, and the accuracy required.

Construction or installation Work shall not commence until the drawings applicable to the construction or installation in question are complete and copies are provided to the WSF Representative in accordance with the *ENGINEERING AND WORKING DRAWINGS PREPARATION* Subsection in this Section of the Technical Specification.

All drawings shall be brought up to date and clearly marked “Final As-Built” upon completion of the Work, with a notation of all alterations necessary to reflect the Vessel as finally completed and accepted.

#### **100.9 TECHNICAL PROPOSAL DELIVERABLE SCHEDULE (TPDS) AND MASTER DRAWING SCHEDULE (MDS) AND PREPARATION**

With the signing of the Phase II “Notice to Proceed” (NTP), submit to the WSF Representative for approval, a Technical Proposal Deliverable Schedule (TPDS), including all Phase II reports, analyses, and other principal documentation and deliverables, except for drawings and plans. At the same time, submit a Phase II Master Drawing Schedule (MDS), including all Phase II drawings and plans.

A Phase III Detail Design and Construction MDS, to include drawings, plans, reports, analyses and other principal documentation shall be provided in the final submittal of the Phase II Technical Proposal.

The Contractor is reminded to consider the sequencing of different types of drawings when organizing each MDS to provide proper sequencing and quantity of drawings which will allow for unhindered review of those drawings. Generally, general arrangement drawings will need to be scheduled prior to system diagrams, and system diagrams prior to arrangement and detail drawings to provide drawing reviewers the necessary information for review and approve of a drawing as set forth in the *REVIEW OF DRAWINGS AND ENGINEERING CALCULATIONS* Subsection in this Section of the Technical Specification.

**NOTE:** *In addition to the above, the Contractor shall adjust submittal/re-submittal quantities to allow WSF to have the resources available to reasonably review each drawing. Mass submittals of new and/or re-submitted drawings (e.g. drawings returned “RETURNED, NOT SUBSTANTIALLY COMPLETE”) may create a unavoidable delay in the review of certain drawings, and may require the Contractor to prioritize those drawings submitted as to order of review. When the sheer quantity of drawings creates a situation where it is unreasonable for WSF to review and return a drawing(s) within the twenty-one (21) day period, the WSF Representative, during that twenty-one (21) day period, will only be required to notify the Contractor, in writing, as to the unreasonableness of the quantity of drawings submitted, and give a reasonable date as to when the drawing(s) can be review and returned. WSF will make every reasonable effort to review all drawings in timely manner. As set forth in the REVIEW OF DRAWINGS AND ENGINEERING CALCULATIONS Subsection in this Section of the Technical Specification, such delays caused*

1                    *my mass submittals and re-submittals which WSF has no control over **shall not***  
2                    *be cause for any claim by the Contractor.*

3    The MDS shall contain the following information for the documentation listed:

- 4        a)    Identification number
- 5        b)    Identification title
- 6        c)    Scheduled date on which each drawing will be submitted for approval
- 7        d)    Columns for recording the actual date(s) of initial submittal (or resubmittal) to the  
8              WSF Representative, the Authoritative Agencies, the approval of each drawing by the  
9              WSF Representative, the Authoritative Agencies, and the latest revision to the  
10             drawing (by letter designation)
- 11       e)    Outline and Shipyard Specification authority

12    The MDS shall identify those documents required to be submitted to cognizant Authoritative  
13    Agencies for approval, review, and/or information and the actual dates of the submittals and  
14    approvals.

15    The MDS shall be continually revised to show all changes, progress and delays. An up-to-  
16    date version shall be submitted monthly together with the Progress Billing until the last  
17    validated FINAL AS-BUILT submission has been delivered to the WSF Representative.  
18    Progress payments **will not** be made until all of the required updated MDS report(s) have  
19    been received by the WSF Representative.

## 20    **100.10 MATERIAL / EQUIPMENT CONTROL SCHEDULE**

21    Within ninety (90) days after signing the Phase II NTP, submit a schedule of  
22    material/equipment to be purchased by the Contractor. The schedule shall not include items  
23    considered as “Stockroom” materials. In general, the items to be listed are: all equipment  
24    with a value over \$5,000 (USD), all material/equipment with a “Lead Time” of over ninety  
25    (90) days, and all material/equipment which delay in procurement could effect completion of  
26    any major milestone identified in the Contractor’s MCS. The schedule shall include the  
27    following information: description of material/equipment; name of vendor; specific purchase  
28    specification; scheduled dates for issue of purchase order; and the lead time for delivery of  
29    the components.

30    Within ninety (90) days after “Notice to Proceed” with the Phase III Detail Design and  
31    Construction, submit a schedule for material/equipment to be purchased by the Contractor.  
32    The schedule shall include all material/equipment except those considered as “Stockroom”  
33    materials and/or disposables. The schedule shall include the following information:  
34    description of material/equipment; name of vendor; commitment date; purchase specification  
35    and purchase order numbers; scheduled and actual dates for issue of purchase order;

purchase order issue and release for manufacture; and the required and actual delivery dates of the components.

Revise and submit the schedules monthly to show all changes and progress until all listed items have been received in the Shipyard. Progress payments **will not** be made until all of the updated Material Control Schedule has been received by the WSF Representative.

## **100.11 QUALITY MANAGEMENT PROGRAM**

A Quality Management Program (QMP) for the Work described in the Technical and Shipyard Specifications shall be established by the Contractor. Within twenty (20) days after “Notice to Proceed” with the Phase III Detail Design and Construction Contract, a QMP Plan shall be submitted to the WSF Representative for approval. The submittal shall consist of four (4) hardbound copies and one (1) CD-ROM or DVD-ROM media copy. The QMP Plan shall, at a minimum, describe and accomplish the following:

1. Describe the Quality Management Program organization, identify key personnel duties. Assign personnel by name and title, and provide twenty-four hour/seven day a week (24/7) contact telephone numbers.
2. Identify the assigned personnel(s) responsible within the QMP, who shall be the Technical Point of Contact (TPOC) for WSF for its review and inspection of the Work. The Contractor shall notify the WSF Representative, in writing, within twenty-four (24) hours of any change in personnel within the Contractor’s QMP organization.
3. Delineate the procedures established for: *i*). controlling engineering and drawing development and adherence to invoked drawing standards; *ii*). design verification; *iii*). minimizing interference between and among structures, piping, ventilation, wireways, and outfitting and; *iv*). providing adequate and safe access for operation and maintenance.
4. Describe implementation of the quality program and training of quality assurance personnel, and production and engineering personnel in QMP procedures and adherence to the QMP Plan
5. Describe the organization and procedures for inspecting and checking the Work in progress for conformity with the Technical and Shipyard Specifications and approved drawings and schedules, *i*). for inspecting the Work for completeness prior to presentation to WSF, *ii*). for giving twenty-four (24) hours advance notice to the WSF Representative for inspection of production milestone “Hold Points” as described in the *INSPECTION* Subsection of Section 1 of the Technical Specification, *iii*). for pre-testing prior to the formal tests as set forth in Section 101 of the Technical Specification, *iv*). for formal testing as set forth in Section 101 of the Technical Specification.

- 1           6. Provide a definition of what quality standards will be used (e.g. ISO standards,  
2           MIL standards, and the like). What program will be used to ensure adherence to  
3           these identified standards.
- 4           7. Provide a narrative description of procedures for the following: *i*). how quality  
5           inspection results are recorded and to whom they are reported, *ii*). how  
6           deficiencies are analyzed, *iii*). how trend analysis of deficiencies is performed,  
7           *iv*). how training requirements are identified and implemented to capture QMP  
8           “lessons learned”.
- 9           8. Describe procedures for accomplishment of any rework of Contract Work that  
10          cannot be accepted as a result of WSF inspection for adherence to the  
11          requirements of the Contract, and how such rework shall be prioritized and  
12          accomplished to meet the Master Construction Schedule (MCS) so as not to cause  
13          any delay to completion of “milestones” or Delivery of the Vessel as set forth in  
14          the *Master Construction Schedule (MCS)* Subsection in this Section of the  
15          Technical Specification.
- 16          9. Describe procedures for establishing subcontractor quality program requirements  
17          in purchase orders and contracts.
- 18          10. Provide documentation showing that all required production and equipment  
19          certifications are current. If they are not, describe the recertification process that  
20          will be used to comply with the Contract requirements.
- 21          11. Describe procedures for compartment close-out inspection/procedures as set forth  
22          in the *Compartment Close-Out Inspection* Subsection of Section 101 of the  
23          Technical Specification after all the Work in a specific space has been completed,  
24          tested, and approved by WSF.
- 25          12. Provide samples of all Quality Assurance tags, forms, and other documentation  
26          that will be used to implement, maintain, and monitor the QMP for this Contract.
- 27          13. Include any and all additional information, procedures, and practices needed to  
28          meet the requirements of this Contract, and the Contractor’s unique needs where  
29          approved by the WSF Representative on a “case-by-case” basis.

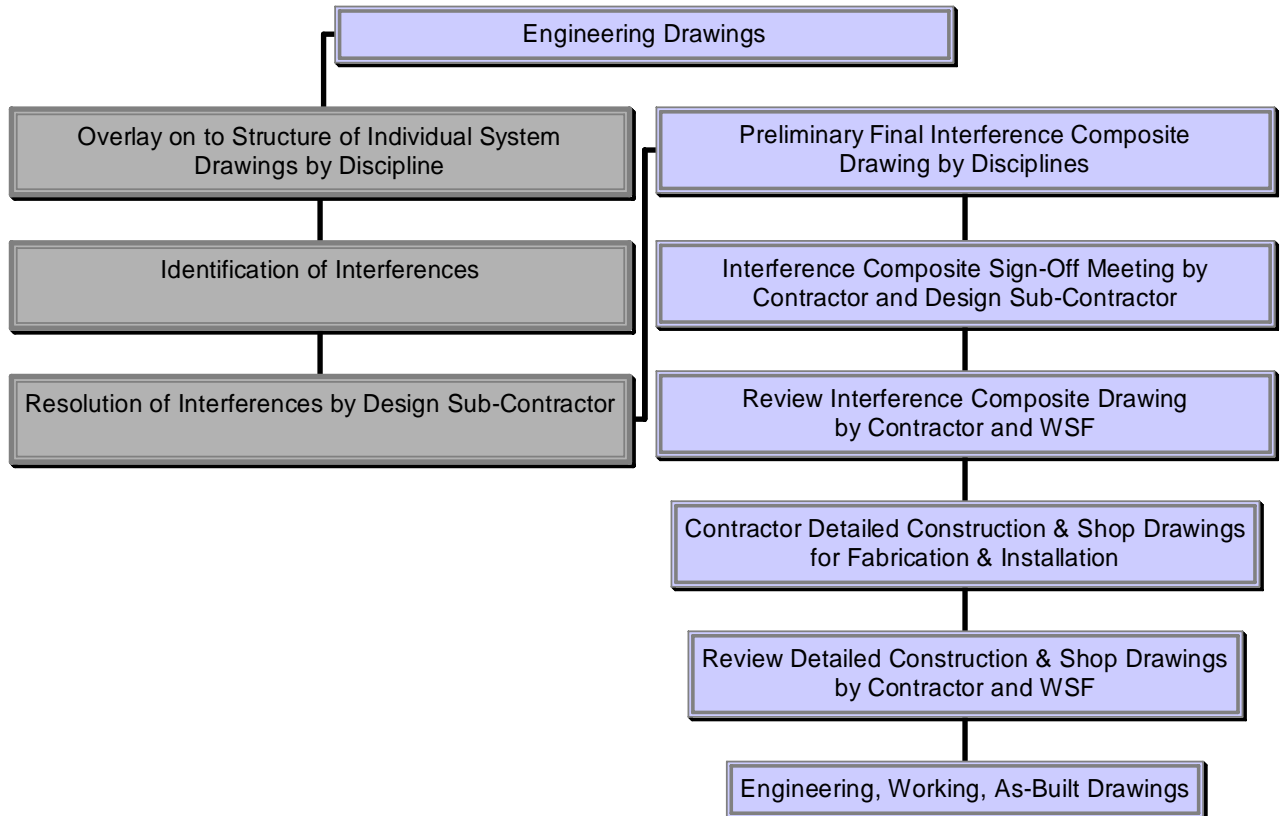
## 30   **100.12   STRUCTURAL, MECHANICAL, ELECTRICAL, AND PLUMBING** 31   **SYSTEMS INTERFERENCE CONTROL**

32   To prevent interference between structural, mechanical, electrical, and plumbing systems on  
33   board the Vessel(s), the Contractor shall design and provide an active and effective  
34   Interference Control Program (ICP) during Phase II Technical Proposal, and Phase III Detail  
35   Design and Construction. The ICP shall be described and be part of the Contractor’s QMP  
36   plan, required in the previous Subsection. The ICP shall incorporate overlay or composite  
37   drawings, or a computerized interference elimination system. The Contractor shall assign a

1 primary and secondary coordinator of the Contractor's staff in writing, by name, to be the  
2 person(s) in charge of overseeing the Interference Control Program, and signing off on each  
3 system design once verified free from interference with other system designs throughout the  
4 design and drawing process. The person(s) so designated shall have **final authority** and  
5 **decision-making** responsibilities for the accomplishment of the actions outlined by the ICP.  
6 The Contractor shall notify the WSF Representative, in writing, of any change in the primary  
7 and secondary coordinator no less than seven (7) days prior to that change.

8 Periodic (monthly) reports on the Interference Control process, and documentation of the  
9 results shall be provided during Phase II Technical Proposal and Phase III Detail Design and  
10 Construction stages of Work.

11 The program shall incorporate a Sequential Comparison Overlay Process (SCOP). The  
12 process flow shall be as set forth in the SCOP Flow Chart (**FIGURE 100-1**) below:

**SCOP PROCESS**

**FIGURE 100-1**  
**SCOP Flow Chart**

- 1 The order of priority for the Sequential Comparison Overlay Process shall be as set forth in
- 2 the SCOP Table (**TABLE 100-1**) below:

<b>TABLE 100-1</b>  <b>Order of Priority for Sequential Comparison Overlay Process (SCOP)</b>	
Structural Arrangement	It shall be assumed that the Contractor's Vessel structure will be developed and shown, and that the composite shall be updated as detailed structure is developed
Main Engine, SSDG, Sewage Holding Tank Exhaust, and Oil-fired Hot Water Heater Exhaust and Uptakes	Usually first due to large size, defined flow characteristic requirements, and limited space up through machinery casings
Mechanical (HVAC dry)	Usually second due to large size of components
Mechanical (HVAC wet)	Follows HVAC (dry) due to interdependency of these two (2) systems
Plumbing (gravity driven systems)	Design criteria for slope essential for system performance
Plumbing (pressure driven systems)	Lower priority because less difficult to reroute
FO, LO, SW, FW, Hydraulic, A/C Refrigerant, Compressed Air, and Sewage Holding and Transfer piping	Takes first priority if critical to system design requirements
Fire protection	Flexible routing within safety and arrangement requirements
Electrical	Most flexible routing, especially small diameter conduit. Large cables take a higher priority if critical to system design requirements
Control systems	Flexible routing but must limit bend radius for pneumatic tubes
Telephone/Datacom	Flexible routing but must limit bend radius for fiber optic cables

Using SCOP and the sequence priorities as set forth in this Section, the Contractor shall produce a stand alone CAD generated interference control composite drawing deliverable for the first Vessel, and an updated drawing deliverable for each follow on Vessel of the Contract. These deliverables shall include all structural, mechanical, electrical, and plumbing systems, and their interference free interface, laid out by deck level for the entire Vessel. The composite drawings shall be produced and delivered as set forth in this Subsection, and shall be scheduled so as to be produced and approved prior to Working Drawing final preparation and submittal, to allow for their usage during final Working Drawing preparation. Working Drawings for each Vessel **will not** be accepted for review **prior** to WSF approval of the interference free composite drawing for that Vessel. The composite drawings shall be given the same status as any deliverable in the Master Drawing Schedule (MDS) and scheduled to meet the requirements of this Subsection. The composite drawing shall include Plan, Section, and Elevation views in a 2-D or 3-D format, with Details views added as necessary. All systems shall be drawn to scale, and depicted and located accurately to present the actual installations on board. Drafting practices and drawing requirements shall meet the Engineering and Working Drawing Preparation requirements of this Section, Section 1, and Section 87 of the Technical Specification.

#### **100.13 NOISE AND VIBRATION PROGRAM CONTROL PLAN, AND ENGINEERING ANALYSES**

Noise and Vibration Control Plan, and Engineering Analyses for the Work described in the Outline and Shipyard Specifications shall be developed by the Contractor. The Noise and Vibration Control Program Plan's primary activities and milestones shall be integrated into the Master Construction Schedule for monitoring its implementation and progress.

The Noise and Vibration Control Program Plan shall fully address the methodology for integrating the Contractor's administrative, engineering, construction, test and trials, and quality assurance program functions into a cohesive approach for ensuring that Vessel's measured noise and vibration shall not exceed the limits specified by the Outline and Shipyard Specifications. The Plan shall also identify anticipated countermeasures pending design development, such as noise and vibration criteria limits for machinery and equipment procurements, acoustic insulation and enclosures, "floating floor" and decking treatments, HVAC treatments, resilient mounts and hangers, and structural design features, etc., that may be implemented to meet the requirements and limit the Contractor's risk of noncompliance. Integration of the Noise and Vibration Engineering Analyses' predictions and identified countermeasures into the Vessel design, and machinery and equipment procurement process shall also be fully addressed.

Technical requirements for Noise and Vibration Engineering Analyses are discussed in various Sections, and Section 102 of the Technical Specification.

Within sixty (60) days after execution of the Phase II NTP, and the Phase III Detail Design and Construction stages of Work of this Contract, a Noise and Vibration Control Program Plan, and Noise and Vibration Engineering Analyses, shall be submitted to the WSF

Representative for approval. Periodic updates of the Plan and Analyses shall occur at least monthly for the duration of the Phase II Technical Proposal phase of this Contract to incorporate Vessel Design and draft Shipyard Specification developments. The Noise and Vibration Control Plan shall be finalized not less than thirty (30) days prior to completion of the Phase II Technical Proposal phase and submitted for WSF final approval. The Noise and Vibration Engineering Analyses shall continue to be updated monthly for the duration of the Phase III Detail Design and Construction phase of this Contract, incorporating the most current machinery and equipment noise and vibration data and Vessel design developments. These submittals shall consist of four (4) hardbound copies and one (1) CD-ROM or DVD-ROM media copy.

#### **100.14 ENGINEERING & WORKING DRAWINGS AND CALCULATIONS PREPARATION**

Provide all engineering services necessary for the Work in accordance with the Outline and Shipyard Specifications. Engineering services shall include technical calculations, surveys, material selection, preparation of diagrams, sketches, schedules, schematics, data, and preparation of all Working Drawings and As-Built Drawings.

In developing the Detail Design, to meet WSF Technical Library requirements, the requirements of the Outline and Shipyard Specifications shall be met. Where the Contractor sees a modification to the Outline and Shipyard Specifications which might better suit the Work's methods or facilities without detriment to the quality of the end product, the suggestion may be submitted, in writing, with complete backup information to the WSF Representative for consideration and approval.

WSF currently uses AutoCAD®, Release 2006 and saves files as AutoCAD®, Release 2004 files. All drawings shall be prepared using AutoCAD®, Release 2004, or later, and shall conform in format to the standards published in Reference (100A), insofar as practicable. Of particular interest is drawing size and title block information. In addition to three (3) "blue-lines" and one (1) "reproducible", provide the data files of all drawings identically on CD-ROM or DVD-ROM media disks. The eight (8) digit media drawing filenames shall deviate from the AutoCAD® Standard as follows: bbbccdde.dwg where bbb = ZUM or MARAD number, cc = sequential serial number, dd = sheet number, and e = revision number. The electronic file shall be stored on a disk in a directory with a subdirectory. The directory shall be "9000" to represent the Class of Vessel. Drawings that are Vessel specific shall have the last digit of the Class number replaced with a one, two, three, or four representing the individual Vessel. The subdirectory shall be Aaa where aa = department control number. The attribute "FILENAME" in the block "WSFSHT1" and subsequent title blocks shall consist of the subdirectory and electronic filename Aaa\bbbccdde. All drawing sheets shall be evenly zoned. The left and right vertical borders shall, starting at the bottom of the sheet, be zoned "A", "B", "C", and "D" respectively. The top and bottom borders shall, starting from the right, be sequentially numbered, "1," "2," "3" and "4." Follow-on sheets shall sequentially continue ( i.e. "5", "6", "7", "8" and so on ).

1       **NOTE:** Upon a written request from the Contractor, WSF will make available a copy of  
2           the latest WSF drawing standards file (WSF.dws) which is used to check  
3           AutoCAD® drawings for format compliance with Reference (100A). This is the  
4           same file WSF will use to check all drawing submittals for format compliance.  
5           Drawings not meeting the WSF AutoCad standards **will not** be accepted for  
6           review.

7       The Contractor will be provided approved Title Blocks and Drawing Sheets for Working  
8       Drawings, in magnetic media format, by the WSF Representative. These Title Block and  
9       Drawing Sheet formats shall be used in preparation of all such drawings to be submitted to  
10      the WSF Representative for approval.

11      A sample “Top” Drawing Sheet, including the Contractor’s Title Block, shall be submitted to  
12      the WSF Representative for approval prior to the submission of any drawings.

13      Drawings shall not contain reference to Contractor-unique standards and processes without  
14      provision of the details of the standards and/or processes.

15      All drawings shall be provided with a complete list of reference drawings, in the reference  
16      column, which interact with that particular drawing to provide all required data to complete  
17      the system and allow the user the ability to readily review all aspects of an installation.

18      Drawings shall be designed and produced to clearly depict all aspects of a particular  
19      installation and/or fabrication so current and future users will clearly understand the Work  
20      from a thorough review of the drawing, without the need to be on the Vessel. Installations  
21      shall be clearly and accurately depicted on each drawing to show what is in fact going to be  
22      produced. The mere reference to one nebulous detail followed by “similar to...” **will not** be  
23      acceptable.

24      All drawings shall be of such drafting quality, and have lettering and numbering of such size  
25      and style as to provide easy reading and permit legible half-size reproduction.

26      The Contractor is reminded to refer to Section 87 of the Outline and Shipyard Specifications,  
27      in addition to this Section and other Sections of the Outline and Shipyard Specifications for  
28      unique design requirements for electrical engineering calculations and/or drawings.

29      Drawings shall contain complete dimensional data which will allow the user to accurately  
30      locate machinery and equipment installations within acceptable tolerances as governed by  
31      the Technical Specification, manufacturer’s requirements, and industry standards. All  
32      equipment, piping runs, ventilation ductwork, all main cable way transits and collars,  
33      structure, and the like shall be accurately located and dimensioned. **All drawing dimensions**  
34      **shall be in conventional English inch units of measurement.** Dimensions over 72 inches  
35      shall be in *feet* and *inches*, dimensions 72 inches and less shall be shown in *inches* only.  
36      Fractional inches may be shown in either architectural (2¼) or engineering (2.25) format but  
37      the same system shall be used consistently throughout the drawing. If desired for clarity, the  
38      drawing may show metric measurements enclosed in brackets in addition to the English

1 dimensions required above. If this method is employed, both scales used and the units of  
2 measure shall be indicated.

3 The first general note on **all** drawings shall read as follows: "All materials and workmanship  
4 shall meet the requirements of U.S. Coast Guard (USCG), Center for Diseases Control  
5 (CDC), United States Public Health Service (USPHS), and all applicable Authoritative  
6 Agencies".

7 WSF will not be responsible for checking for errors or omissions in the Contractor's  
8 engineering calculations and Working Drawings. The WSF review will not relieve the  
9 Contractor of responsibility for deviations from the Outline and Shipyard Specifications  
10 unless the Contractor has, in writing, called attention to the deviation at the time of drawing  
11 submittal. Review or Approval of a drawing does not constitute approval of a deviation,  
12 mistake, or omission. WSF approval of a deviation from the Outline and Shipyard  
13 Specifications will not relieve the Contractor of the responsibility for satisfactory operation  
14 of any item or system. Any Work done prior to the WSF review of the Contractor's  
15 drawings will be at the Contractor's own risk.

16 WSF Review or Approval of any Working Drawings will not relieve the Contractor of  
17 responsibility for accuracy of dimensions and details, nor shall mutual agreement of  
18 dimensions or details relieve the Contractor of the responsibility for agreement and  
19 conformity of the Working Drawings with the Contract, or constitute acceptance by WSF of  
20 the correctness or adequacy of the drawing to meet the requirements of the Contract.

21 Drawings shall be sized and presented on "D" size (22" × 34") paper. Booklets of details  
22 may be on sheets 11" × 17" or 8½" × 11".

23 Drawing view titles shall be "zone designated" to identify the zone in which the drawing title  
24 is located. Revision block zones shall identify from which zone of the drawing the change  
25 (revision) has been made, **not** the view title zone.

26 All Work on drawings shall be shown in a "Plan View." "Section," "Elevation" and "Detail"  
27 views shall indicate from which "Plan View" that view has been taken (e.g. for Section View  
28 title "Section 2-F (2-A)", "Section 2-F" is the view call-out located in zone "2-F" and  
29 "(2-A)" is the "zone" location within a Plan View or Elevation View from which the Section  
30 View has been taken). Each drawing shall contain a view showing the entire system covered  
31 by the drawing, in diagrammatic or schematic form, or a "Key Plan." Each drawing Plan  
32 View shall show the complete system in its entirety, merely showing one End of the Vessel  
33 and indicating that the other End is similar **shall not** be accepted. All views shall contain  
34 centerlines or frame reference lines as well as indication in the view title to indicate the  
35 direction of that view, distance from baseline, and/or the level or levels of the Vessel shown  
36 by that view. End No. 1 of the Vessel shall always be to the right in all "Plan Views".

37 Drawings shall be designed and produced to clearly depict all aspects of a particular  
38 installation, modification, and/or fabrication so current and future users will clearly

1 understand the Work from a thorough review of the drawing, without the need to be on the  
2 Vessel.

3 Arrangement drawings shall depict machinery, equipment, furnishings and the like as they  
4 actually would look. All such representations shall be drawn to scale so as to accurately  
5 represent the “foot print” the particular machinery, equipment, furnishing, etc. will occupy.  
6 A simple block on the body of the drawing to represent a machinery, equipment, furnishing,  
7 etc. **is not acceptable** and will be cause for rejection of the drawing.

8 Drawing scales shall be a minimum of  $\frac{1}{2}$  inch = 1 foot for fabrication and installation  
9 drawings unless otherwise approved in writing by WSF. Details on all Working Drawings  
10 shall be of a larger scale than the view from which it has been cut. All machinery,  
11 equipment, furnishings, etc. shall be depicted with a reasonable amount of true detail as they  
12 actually would look and shall, in all cases, be drawn to scale.

13 All abbreviations shall be in accordance with ASME Y14.38 (MIL-STD-12D or later  
14 revision). The usage of abbreviations is discouraged.

15 All weld symbols and sizes shall be in accordance with the American Welding Society  
16 (AWS) and shall be shown on the body of the drawing. The use of symbols other than these  
17 will be cause for immediate rejection of the drawing.

18 Electrical and electronics Working Drawings shall use the symbols identified in  
19 IEEE STD 315 and ANSI Y32.2. The use of formats or symbols other than these will be  
20 cause for immediate rejection of the drawing.

21 Piping diagrams shall designate valves as to “normally open” (NO) or “normally closed”  
22 (NC) condition on the body of the drawing at each valve to depict normal system valve line  
23 up.

24 Piping symbols shall be those developed in ASTM F1000. The use of symbols other than  
25 these will be cause for immediate rejection of the drawing.

26 Ventilation symbols shall be those developed in ASTM F856. The use of symbols other  
27 than these will be cause for immediate rejection of the drawing.

28 All material shown on drawings shall have piece marks and be identified in a material list by  
29 material specifications, ASTM, ANSI, NEMA, or equivalent, as appropriate.

30 **NOTE:** All material shall be specifically identified as to manufacturer, model number or  
31 part number, style, color, rating and the like to make it possible for WSF to  
32 clearly identify the specific material. An entry including an “or equal” **will not**  
33 be acceptable. All material which may become no longer commercially  
34 available during the life of the Contract shall be subject to the requirements as  
35 set forth in **VOLUME III - CONTRACT PROVISIONS** as to “OR EQUAL”.

Material lists shall be on full sized drawing sheets and made part of the applicable drawing.

Where trade association designations are commonly used, like Anti-Friction Bearing Manufacturers Association (AFBMA) for bearings, those designations shall be included in the list.

Three (3) copies of each Engineering Change Notice (ECN), or other document used by the Contractor to implement field changes prior to drawing revision, shall be provided to the WSF Representative when issued. The WSF Representative may require that ECNs be incorporated into a Working Drawing and be submitted for review. Should the WSF Representative elect not to require immediate incorporation into a Working Drawing, the Contractor may accumulate several ECNs for incorporation as a single revision to the next drawing issue, or the validated Final As-Built drawing. Any drawing which accumulates more than three (3) ECNs shall have those ECNs incorporated and the drawing revised and reissued. All ECNs shall be of the same WSF approved format. The approved standardized ECN format shall include: 1). Title, 2). Date, 3). Affected document, 4). Change, 5). Reason for change, 6). Originator signature, 7). Contractor approval signature, 8). WSF Representative approval signature, 9). Revision list. All ECNs shall be incorporated, at a minimum, into the Final As-Built Drawings. Each unincorporated ECN shall be provided as attachment(s) to all drawing(s) deliverables of the subject drawing(s) until such ECN has been incorporated as a revision to it's associated drawing(s). See the *ENGINEERING AND WORKING DRAWINGS* Subsection of this Section of the Technical Specification

Revisions to each previously approved drawing shall be described concisely in a revision column on the body of the drawing. Revised drawings shall be resubmitted to the WSF Representative for review, except where minor revisions, as determined by the WSF Representative, do not alter the arrangement, function, or material of a system. Symbols identifying the revision shall be placed in those areas of the drawing affected by the revision. The revision column shall also indicate the location and/or locations of that revision on the body of the drawing. Revisions necessitated by ongoing design development shall be designated by the revision letter inside a triangle with the particular revision number at the top right hand peak of that symbol. Revisions necessitated by Contract changes shall be designated as above, except a double triangle shall be used to distinguish them from design developments and corrections due to approval action. The latest revision of the drawing shall appear in the title block and on each sheet of the drawing. All drawings shall remain Revision “-” until they have been accepted under “REVIEWED” by WSF. Revision “-” drawings shall be submitted as “FIRST SUBMITTAL”, “SECOND SUBMITTAL”, and so forth. Once a drawing has been accepted under “REVIEWED” by WSF, each subsequent submittal shall be an “alfa” revision change. See **FIGURE 100-2** below.

The Contractor shall prepare and submit to the WSF Representative for approval, a ***Drawing Check-off List***. This list shall provide a listing of all required QMP, checks, attachments, Professional Engineer's stamp, and all other items needed to be complete or accompanying the submittal drawing. The list shall be formatted so that all items can be addressed and checked off as complete/attached, have an area for comment, and shall have a an area where

1 the cognizant Contractor's representative can sign attesting to the completeness of the  
2 deliverable. The Contractor shall submit a sample of the proposed ***Drawing Check-off List***  
3 to the WSF Representative for approval no later than fourteen (14) days prior to the first  
4 drawing submittal.

5 Each drawing shall be initialed in the appropriate box by the drafter and the engineer  
6 responsible for the design and shall be finished and checked and include a completed and  
7 signed drawing Check-off List before submitting to WSF. All drawings and calculations  
8 submitted to the WSF Representative for review and/or approval shall bear the stamp or seal  
9 of the licensed Professional Engineer under whose supervision they were developed and  
10 prepared as required by Washington State RCW 18.43 and as outlined in WAC 196-24-095  
11 and WAC 196-27-020. Drawings without the appropriate signatures or stamps,, drawing  
12 check-off list, and drawings which are not substantially complete, **will not** be reviewed by  
13 WSF and will be returned stamped "RETURNED, Not Substantially Complete" as set forth  
14 in **FIGURE 100-2** below.

15 Copies of all comment letters received from Authoritative Agencies to the Contractor shall  
16 be furnished to the WSF Representative within twenty-four (24) hours of their receipt.

17 At the time of delivery of each Vessel to WSF, a complete, full sized set of the latest revision  
18 of each drawing for that Vessel shall be provided to the WSF Representative for the Vessel.

19 Sub-contractor-generated drawings shall conform to **all** requirements applicable to the  
20 Contractor-prepared drawings.

## 21 **100.15 REVIEW OF DRAWINGS AND ENGINEERING CALCULATIONS**

22 Working drawings and engineering calculation deliverables shall be submitted by the  
23 Contractor to WSF in a timely fashion, taking into account the time required for review.  
24 When submitting foundation or system design drawings, such as piping diagrams and wiring  
25 diagrams, all calculations by which the system components were sized shall be included.  
26 WSF **will not** review these drawings without their supporting calculations. The WSF  
27 Representative will normally respond to submittals within twenty (20) days of receipt, with  
28 "REVIEWED"; "REVIEWED, and Returned With Comments"; "RETURNED, Not  
29 Substantially Complete"; or "RETURNED, For Revision" as defined in **FIGURE 100-2**  
30 below, and the *Interim Review Comments* Section of **VOLUME II ~ REQUIREMENTS**  
31 **FOR DEVELOPMENT OF PHASE II TECHNICAL PROPOSALS** of the Contract.

<p align="center"><b>FIGURE 100-2</b></p> <p align="center"><b>REVIEW COMMENT DEFINITIONS</b></p>	
<b>“REVIEWED”</b>	Deliverable has been reviewed by WSF and no discrepancies, deficiencies or differences from the Technical Specification have been noted.
<b>“REVIEWED, and Returned With Comment”</b>	Deliverable has been reviewed and minor discrepancies, deficiencies or differences from the Technical Specification have been noted and shown in comments by WSF. These comments need to be satisfactorily addressed, at which time the deliverable is to be resubmitted to WSF.
<b>“RETURNED, Not Substantially Complete”</b>	Deliverable was seriously incomplete and not ready for review. Deliverables which are not substantially complete, <b>will not</b> be reviewed by WSF and will be returned stamped “RETURNED, Not Substantially Complete”. These submittals <b>do not</b> count towards fulfilling the Contractor’s obligation in regards to scheduling, i.e., a drawing returned “RETURNED, Not Substantially Complete” must be resubmitted complete within the scheduled time.
<b>“RETURNED, For Revision”</b>	Deliverable was either incomplete, incorrect and/or failed to meet the requirements of the Technical Specification in serious ways that require extensive revisions to correct.

1

2 As-Built drawings shall be submitted by the Contractor to WSF in a timely fashion, taking  
3 into account the time required for review and approval. The WSF Representative will  
4 normally respond to submittals within twenty (20) days of receipt, with **“REVIEWED”**,  
5 **“REVIEWED, and Returned With Comments”**.

**NOTE:** The sequencing of drawing submittals by type, as set forth in the *MASTER DRAWING SCHEDULE (MDS) AND PREPARATION* Subsection in this Section of the Technical Specification is required to facilitate a rapid review or approval of drawings. The Contractor is cautioned that drawing submittals without supportive documents and listed References which are not substantially complete may not be able to reviewed by WSF within the twenty-one (21) day period (if at all). WSF will make every effort to review those drawings it can, but submitting drawings without supportive documents and References which delay the WSF review process **shall not** be cause for any claim by the Contractor. See the *MASTER DRAWING SCHEDULE (MDS) AND PREPARATION* Subsection in this Section of the Technical Specification.

When submitting a drawing for review or approval, the Contractor shall identify and describe any departures from the Outline and Shipyard Specifications or instructions received from WSF. When this requirement is not met, WSF Representative review or approval will not relieve the Contractor of responsibility to provide materials, installation, and operation of all items in full compliance with the Outline and Shipyard Specifications. Four (4) prints, including one (1) rolled print, of each drawing shall be submitted to WSF, with a submittal form giving the drawing number, revision letter, title, date submitted, and spaces for WSF to enter the return date, review or approval action, comments, reviewer's name, and signature of the WSF authorized representative. One (1) submittal form shall accompany each drawing. Working Drawings for submittal shall be complete in all respects with all material and equipment shown and shall be accompanied by supporting calculations where applicable.

In addition to technical review, drawings will be reviewed for formatting using the WSF drawing standards file spoke to in the *ENGINEERING AND WORKING DRAWINGS PREPARATION* Subsection in this Section of the Technical Specification.

WSF will review drawings submitted, provide written comments and, when necessary, mark a print with a "RED" pen to clarify comments, WSF will return a print and an executed copy of the submittal form to the Contractor.

## **100.16 AS-BUILT DRAWINGS**

Update all Working Drawings to conform to an "As-Built" condition and stamp "FINAL AS-BUILT" in the title block. The final drawings shall reflect systems and arrangements of each successive Vessel as finally completed and accepted.

As-Built Drawings shall meet all requirements of the *ENGINEERING AND WORKING DRAWINGS PREPARATION* Subsection in this Section of the Technical Specification, and Shipyard Specification, and must be approved utilizing the procedures of the *ENGINEERING AND WORKING DRAWINGS PREPARATION* and *REVIEW OF DRAWINGS AND ENGINEERING CALCULATIONS* Subsections in this Section of the Technical Specification, and the Shipyard Specification. Within thirty (30) days of delivery of each Vessel to WSF, the Contractor shall submit one (1) full size Mylar reproducible and three (3) prints of each

“FINAL AS-BUILT” drawing to WSF for approval. After approval, the Contractor shall deliver to the WSF Representative two (2) full size prints of all Working Drawings, calculations and reports, folded for legal sized stowage, assembled in sets, one (1) set marked “Vessel Design”, one (1) set marked “Project Office”. In addition, the Contractor shall deliver three (3) full size prints of the drawings, selected by the WSF Representative, folded for legal sized stowage, assembled in sets marked “Vessel”, “Port Engineer”, and “Eagle Harbor”. The Contractor shall also provide two (2) copies of all drawings in electronic files on CD-ROM or DVD-ROM disks in AutoCAD<sup>®</sup>, Release 2004, or later, format. The five (5) prints of smaller drawings, such as 8½" × 11" and 11" × 17", shall be on bond paper.

#### **100.17 COMPARTMENT CLOSE-OUT INSPECTION**

Compartment/Area close-out inspections shall be provided the same status as a system test, and all the requirements, procedure formats, forms, notifications, scheduling, etc. of Section 101 of the Outline and Shipyard Specifications shall apply.

When all Work in a compartment or exterior area, affected by the Contract, has been completed, the Contractor shall request a joint inspection with WSF. Prerequisites to the joint inspection shall be Contractor’s QA documentation certifying the Contractor satisfaction with the completion of Work, and as required below. The Contractor shall provide twenty-four (24) hour written notice in accordance with the requirements of Section 101 of the Outline and Shipyard Specifications. Compartments/Areas that have had prior close-out inspections shall be so indicated and the list of prior discrepancies shall be included with the notification. List all drawings and Engineering Change Notice(s) (ECN) applicable to the Work accomplished in the subject Compartment/Area. A written procedure for compartment close-out shall be submitted for approval as required by Section 101 of the Outline and Shipyard Specifications.

Criteria for appropriate completion prior to Compartment/Area Close-out inspections shall, at a minimum, include the following:

1. Compartment/Area shall be complete with all supportive services pulled back and clear.
2. Craft persons shall be completed with the Compartment/Area and no on-going Work shall be underway during the inspection.
3. Compartment/Area shall be totally outfitted as they will be in service.
4. Compartment/Area shall be cleaned (includes decks waxed, paint dry, equipment dusted, windows washed, etc.).
5. Compartment/Area being inspected shall be supported by all of the ship’s services normally associated with that compartment/area (i.e. ventilation, lighting, etc.).

- 1        6. Compartment/Areas which normally do not have lighting, or have low lighting levels  
2        (i.e. Voids, etc.) shall have adequate additional temporary lighting provided during  
3        the inspection.
- 4        7. Contractor shall have available a representative of each craft and/or sub-contractor to  
5        clear minor discrepancies during the inspection when possible.
- 6        8. Contractor shall close off access to the compartment/area to preserve inspected  
7        condition.

8        Compartment Close-Out Inspection shall be jointly conducted by the Contractor and the  
9        WSF Representative for each compartment and exterior area of the Vessel affected by the  
10       Work.

11       The procedure for compartment close-out shall also include, but not be limited to, the  
12       following:

- 13       1. Contractor shall assign a recorder to document any discrepancies noted during the  
14       close-out inspection.
- 15       2. Interior compartments without windows shall be fully illuminated by the Vessel  
16       lighting system within that compartment.
- 17       3. Exterior areas and interior compartments with windows shall be inspected during  
18       daylight hours only, and all Vessel lighting systems in the area shall be turned on  
19       during the close-out inspection.
- 20       4. On completion of the Compartment Close-out Inspection, the Contractor and the  
21       WSF Representative, shall review the Compartment Close-Out Inspection document  
22       and discrepancy list, sign it, and date it.

23       The Contractor shall provide and use a compartment close-out document and discrepancy list  
24       as a running inventory of discrepancies and assign responsibility for discrepancy correction.  
25       The Contractor shall provide and submit the above mentioned document and list to the WSF  
26       Representative, and update it continually until all compartments have been inspected and  
27       accepted by the WSF Representative.

## 28       **100.18 NAMEPLATE DATA**

29       Furnish a listing in booklet form, giving the complete nameplate data for each identifiable  
30       piece of equipment and machinery, whether furnished by the Contractor or WSF, including,  
31       but not limited to, vent fans, vent controllers, motors, pumps, compressors, fire fighting and  
32       extinguishing equipment, Steering Gear, Food Vending area equipment, electronics gear, etc.  
33       The listing shall include each separate part of assemblies, skid mounted units, etc.

Equipment without nameplates shall be listed by make, noun name, model, serial number, and the like.

The listing shall incorporate digital pictures of all nameplates, wherever possible, to satisfy the requirements of this Subsection. Where the digital nameplate picture does not contain all available required data, missing data shall be included with the digital picture.

Two (2) draft copies of the Nameplate Data Booklet shall be submitted to the WSF Representative for approval not later than thirty (30) days prior to delivery of the Vessel.

After incorporation of all material required by the WSF review, the Contractor shall deliver five (5) paper copies of the finished product, bound on Mylar reinforced edge punched paper, shall be bound in substantial loose leaf three (3) inch or less, "D"-ring double lock type, Presentation View, 3-ring binders, with durable oil and water-repellent hard covers, suitably marked on the front cover and spine as to content. Final copies shall be delivered concurrent with the delivery of each Vessel. The Nameplate Data Booklet shall be delivered in both paper form and identically on CD-ROM or DVD-ROM media disks, in the format of MICROSOFT® Word™ 2003, Word for Windows™, or convertible equal, but in any case, noting the identity of the software used.

#### **100.19 EQUIPMENT LIST AND BUILDER'S RECEIPT**

Prepare an Equipment List of all portable equipment, tools, and spares, to include those furnished by the Contractor and those furnished by WSF and delivered to the Contractor during the Work, which are required to be on board at the Vessel's delivery. Submit two (2) draft copies of this list to WSF for approval not less than fifteen (15) days prior to the scheduled delivery.

Furnish three (3) sets of the approved Equipment List, with table of contents, for the inventory to be taken at delivery. Record the inventory on one (1) list, which will become the original inventory and correct the other lists to match the original. The original and one (1) list shall be signed by both the WSF Representative and the Contractor. WSF will receive the original signed list, the Contractor will receive the signed copy, and the unsigned copy will go to the Vessel. If the Equipment List has been produced using non-proprietary software, provide the data files in final paper form and identically on DVD-ROM or CD-ROM media disks, in the format of MICROSOFT® Word™ 2003, Word for Windows™, or convertible equal, but in any case, with the identity noted of the software used.

Furnish two (2) additional copies of the final Equipment List to WSF for office use by the Port Engineers and WSF Eagle Harbor staff.

#### **100.20 DISPLAY DRAWINGS FOR MOUNTING ON BOARD**

The drawings or documents listed in **TABLE 100-2** shall be provided as non-fading positive prints. All drawings and documents shall be prepared using AutoCAD®, Release 2004, or

later format and meet the requirements of the *ENGINEERING AND WORKING DRAWINGS PREPARATION* Subsection in this Section of the Technical Specification. The prints shall be provided and mounted as specified in **TABLE 100-2** below.

“Soft” plastic laminated drawings shall be laminated with 1.5 mil soft plastic sheet material (2 sheets, 3.0 mil total thickness) such that they can be rolled up and placed in a four (4) inch diameter, Schedule 40, PVC tube with capped ends for emergency use.

A PVC tube shall be mounted on each End of the Lower Vehicle Deck adjacent to the Firemain shore connection using ASTM F708, Figure 1 *Split Cap Hangers* pipe hangers. Final locations shall be as approved by the WSF Representative.

“Hard” plastic laminated drawings shall be laminated with  $\frac{1}{16}$  inch hard plastic (total thickness). Where mounting is indicated on **TABLE 100-2**, drawings shall be bulkhead or otherwise mounted as specified by the WSF Representative.

<b>TABLE 100-2</b>			
<b>DISPLAY DRAWINGS</b>			
	<b>SOFT PLASTIC LAMINATED DRAWINGS</b>	<b>HARD PLASTIC LAMINATED DRAWINGS</b>	
<b>DRAWING DESCRIPTION</b>	<b>QTY</b>	<b>QTY TO BE MOUNTED</b>	<b>QTY TO BE DELIVERED TO WSF REPRESENTATIVE</b>
Fire Protection Plan	5	2	2
AC Electric Power Distribution One-Line Diagram	4	1	2
Steering Gear Piping Diagram	0	2	2
Steering Gear Wiring Diagram	0	2	2
Steering Gear Operating Instructions	0	2	2
Emergency Diesel Generator Operating Instructions	0	1	2
Bilge System One-line Diagram	2	2	2
Fuel Oil System One-line Diagram	0	2	2

<b>TABLE 100-2, cont'd DISPLAY DRAWINGS</b>			
	<b>SOFT PLASTIC LAMINATED DRAWINGS</b>	<b>HARD PLASTIC LAMINATED DRAWINGS</b>	
<b>DRAWING DESCRIPTION</b>	<b>QTY</b>	<b>QTY TO BE MOUNTED</b>	<b>QTY TO BE DELIVERED TO WSF REPRESENTATIVE</b>
Used Oil System One-line Diagram	0	2	2
Sewage Transfer System	0	2	2
Stern Tube Lube Oil System	0	2	2
Clean Lube Oil System (Main Engine)	0	2	2
Clean Lube Oil System (Ship Service Diesel Generators)	0	1	2
Hi-Fog High Pressure Water Mist Fire Suppression Systems Piping Diagrammatic Arrangement	2	1 at each Fire Protection Control Station	2 each
Hi-Fog High Pressure Water Mist Fire Suppression Systems Operating Instructions	2	1 at each Fire Suppression Control Station	2
Engine Room Semi-Portable CO <sub>2</sub> Systems Operating Instructions	0	1 at each Semi-Portable CO <sub>2</sub> Station	0
Fire Damper Diagram	2	1	2
HW Heating Piping Diagram	0	3	2
FW Cooling Piping Diagram	0	3	2
Circuit "FR" Wiring Diagram	0	1	2

In addition, provide and place on board all plans and documents required by Authoritative Agencies. Prior to delivery, obtain a Stability Letter in accordance with 46 CFR §170.120, provide a suitable anodized aluminum or stainless steel frame, and install the framed Stability Letter under glass in Pilothouse No. 1 in a location as directed by the WSF Representative.

Informational signs intended for use by Passenger and Crew shall carry the noun name designations.

For Engineering Crew drawing display board requirements see the *Engineering Crew Display Board* Subsection in Section 24 of the Technical Specification.

## **100.21 BUILDER'S SCALE MODELS**

No later than eight (8) months from the date of WSF approval of the Outboard Profile, Funnel, Inboard Profile, Line & Offsets (hull form), Midship Section, exhaust & uptake mechanical layouts, rudder & propeller mechanical layouts, and arrangement drawings, deliver to WSF two (2) Builder's Scale Models. Each Model shall be of presentation quality to a scale of  $\frac{1}{8}$  inch = 1 foot, shall be mounted on a wood base of teak or oak and shall be fitted with a minimum  $\frac{1}{4}$  inch thick Plexiglas cover. The Model shall be oriented such that End No. 1 (Bow) is to the right when viewed from the front of the display cabinet, and flags shall indicate that the Vessel is moving in that direction. A bronze nameplate similar to that provided on the Jumbo Mark II Model spoken to below shall be provided with engraved lettering depicting the Vessel's Class name, Vessel Length, Vessel Beam, Vessel Vehicle and Passenger Capacities, the Owner's name, the builder, and the architect. The layout of the nameplate shall be submitted to the WSF Representative for timely approval prior to manufacture. Each model shall be delivered in a durable shipping crate equipped with hinges and latches and otherwise designed for easy re-use for transportation of the Model.

All exterior details of the Models will be shown with accurate colors in accordance with the Contractor's approved design and the requirements of the Outline and Shipyard Specifications. Show major items visible through the Pilothouse windows but not Passenger compartment furniture. The Vehicle Decks are to be fully loaded with a mix of cars and trucks using commercially available scale models. The Passenger accessible weather decks shall include a minimum of twenty-four (24) "to scale" passengers in a mixture of different gender, ages, and poses.

The Model of the WSF *Jumbo Mark II* Class, on display in the Washington State Ferry offices at 2901 Third Avenue in Seattle, shall be used as a benchmark of quality and detail for the New 144-Auto Ferry Model. One suitable model maker is Mr. Robert Combs, Combs Ship Modeling, Bainbridge Island, WA (206) 842-0872.

## **100.22 STABILITY ASSESSMENT REPORT AND STABILITY LETTER**

A preliminary Stability Assessment Report for the Vessel is available for Contractor's information as described in Section 1C of the Outline and Shipyard Specifications. The Lightship and Deadweight data used in this document are based on estimates made during design development at the date indicated. The report is intended for guidance purposes only in preparing the stability calculations required by 46 CFR, Sub-chapter S.

A Stability Assessment Report (stability calculations) shall be prepared by the Contractor for submittal to the USCG. These calculations shall be produced using General Hydrostatics (GHS) computer software, and the data files shall be provided on paper and identically on CD-ROM or DVD-ROM media disks. The calculations shall be in sufficient detail that following the establishment of the approved Stability Test (inclining experiment) Lightship data, a Simplified Stability Letter (in accordance with 46 CFR §170.110(e)) can be obtained from the USCG.

Submittal to the USCG (with two (2) copies to WSF) of the Stability Calculations shall be made sufficiently in advance of the Stability Test conducted during Phase III Detail Design and Construction stage of the Work so as not to delay issuance of the Simplified Stability Letter. Upon receipt from the USCG and prior to delivery, the Contractor shall deliver the original Simplified Stability Letter and USCG stamped copy of the Stability Calculations to the WSF Representative.

## **100.23 ADMEASUREMENT PLAN**

The Contractor shall prepare an Admeasurement Plan during Phase III Detail Design and Construction stage of the Work for use in obtaining the tonnage certificates required by Section 1C of the Outline and Shipyard Specifications.

## **100.24 REPORTS AND CALCULATIONS**

Except where noted otherwise for particular cases, reports shall be organized, prepared and produced in accordance with ANSI Z39.18-1987, *Scientific and Reports - Organization, Preparation, and Production*.

Field engineer and technical specialist reports required under Sections 1 and 1C of the Outline and Shipyard Specifications may be formatted in accordance with standard report formats of the manufacturer's or vendor's representatives, in lieu of the ANSI format prescribed herein.

Calculations required throughout these requirements in support of drawing development or for any other purpose shall be prepared. All calculations submitted to the WSF Representative for review and/or approval shall bear the stamp or seal of the licensed Professional Engineer under whose supervision they were developed and prepared as required by Washington State RCW 18.43 and as outlined in WAC 196-24-095 and

WAC 196-27-020 as set forth in the *ENGINEERING & WORKING DRAWINGS AND CALCULATIONS PREPARATION* Subsection in this Section of the Technical Specification.

Piping system calculations shall include calculations for sizing piping, pumps, and any fabricated heating/cooling coils and manufactured heat exchangers. Pump curves and other data supporting the calculations shall be appended.

Calculations shall be provided supporting the sizing of all tanks on the Vessel, whether or not such calculations are expressly required elsewhere in these Requirements for any particular tank.

A Pump Table giving pump characteristic data shall be developed. During the design, pump head, flow and net positive suction head (NPSH) calculations shall be provided. Characteristic curves and other data, such as suction limits and net positive suction heads, shall be prepared that show the designed performance of all centrifugal pumps throughout their operating ranges.

Engineering calculations shall identify the Vessel, the project, the drawing and system for which the calculations were performed, and the engineer who performed the calculations. Calculations shall be submitted to the WSF Representative for approval. They shall be neatly and clearly produced on 8½" × 11", 8½" × 14", or 11" × 17" sheets, and shall be executed in detail sufficient that they are easy to follow, step by step.

References to textbooks or other reference material shall be minimized. Formulas or constructions used shall be included in the calculation sheets, together with a complete explanation of symbols used.

If calculations have been produced using non-proprietary computer software, provide the data files on CD-ROM or DVD-ROM media disks. Data files submitted on CD-ROM or DVD-ROM disk shall reflect the published hard copies **exactly**.

## **100.25 TECHNICAL PUBLICATIONS**

### **100.25.1 General**

The Contractor shall prepare or obtain, collate, bind, and reproduce as required, instruction books for each Vessel, of all new machinery, equipment and systems provided by the Contractor whether manufactured by the Contractor or not. ***Dimensions and tolerances shall be displayed in the U. S. Customary System of Measurement.*** Metric equivalents shall also be shown, where appropriate. Text and tables displaying metric dimensions will be acceptable provided that conversion to the U.S. Customary System is immediately obvious **without** reference to a conversion table.

Instruction books shall contain information at least equivalent to that available to mechanics at an authorized overhaul facility of the manufacturer of the machinery and/or equipment covered. It is the intent of WSF to totally maintain equipment provided under

the Outline and Shipyard Specifications and sufficient information to do so is required. Omission of information due to reasons such as “not normally furnished” or “factory only” **will not** be acceptable.

Two (2) draft copies of each technical publication shall be submitted to the WSF Representative for approval not later than sixty (60) days prior to delivery of each Vessel. Forty-five (45) days shall be allowed for WSF review.

After incorporation of all material required by the WSF review, the Contractor shall deliver five (5) copies of the finished product. Final copies, on Mylar reinforced edge punched paper, shall be bound in substantial loose leaf three (3) inch or less, “D”-ring double lock, Presentation View, type 3-ring binders, with durable oil and water-repellent hard covers, suitably marked on the front cover and spine as to content. Final copies shall be delivered concurrent with the delivery of each Vessel. Instruction books or manuals prepared by the Contractor using computer word processing equipment shall be delivered both in final paper form and identically on CD-ROM or DVD-ROM media disks, in the format of MICROSOFT® Word™ 2003, Word for Windows™, or convertible equal, but in any case, with the identity noted of the software used.

Diagrams in publications shall be “D” size (22"×34") and readily legible in low light conditions. Operating charts, where provided, shall be above or below the applicable diagram and folded over the diagram. A blank space, equal to the width of the text page, shall be provided on the left end of the diagram.

#### **100.25.2 Technical Publications List**

A Technical Publications List shall be provided within sixty (60) days following signing of Phase II NTP. The list shall be organized both by name of equipment and vendor’s name, of the instruction books that are to be furnished during Phase III Detail Design and Construction stage of the Work. The list shall indicate anticipated dates of submittals for approval. It shall be updated monthly throughout Phase II and Phase III, and shall form the basis for the final list of approved instruction books under the Contract.

#### **100.25.3 Technical Manuals**

Technical manuals shall be provided for each equipment item, machinery item, and system having a single unit value of \$5,000 (USD) or more. Each manual shall be logically arranged and thoroughly address at least the following topics:

- A. Introduction
- B. Installation
- C. Operation and Control
- D. Inspection and Maintenance
- E. Overhaul and Repair

- 1 F. Testing and Trouble Shooting
- 2 G. Parts (including listing of all assembly parts and recommended spare parts by
- 3 noun name and manufacturer's part number)
- 4 H. Appendices including:
  - 5 1. Manufacturer (or Contractor) recommended maintenance schedule
  - 6 2. Operating parameters and limits (temperatures, pressures, other salient
  - 7 parameters)
  - 8 3. Clearance and alignment data with tolerances
  - 9 4. Alarms and safety features data
  - 10 5. Fluids data and requirements (lubricants, coolants, and others)
  - 11 6. Mass elastic data (propulsion system components only)
- 12 I. Drawings including:
  - 13 1. Equipment drawings
  - 14 2. Piping schematics
  - 15 3. Wiring diagrams/schematics for power, controls, and electrically-controlled
  - 16 alarms and safety features

17 Equipment drawings shall include plan, section and elevation views. Drawings shall  
18 depict reference dimensions, parts identification, equipment arrangement, support points,  
19 pertinent details of components (such as gears, couplings, shafts, bearings, pump drives,  
20 and piping connections), equipment wet and dry weight (as applicable) and center-of-  
21 gravity.

22 In addition to the technical manuals described above, **all** machinery, equipment and  
23 systems having a single unit value of less than \$5,000 (USD) shall be provided with the  
24 standard installation, maintenance, and operating instructions; parts lists; and other  
25 technical information normally supplied by the manufacturer with the item/system. This  
26 information shall be consolidated into the number of binders necessary to present the  
27 material in an orderly and logical manner. Each volume shall include an index and tabs  
28 to facilitate use.

#### 29 **100.25.4 Engineers' Operating Manual**

30 An Engineer's Operating Manual shall be provided, giving complete instructions  
31 regarding the operation of **all** propulsion, electrical, auxiliary and hot water heating  
32 (waste heat recovery), and the related control systems and equipment. The manual shall  
33 be prepared in such a manner that it may be readily understood by operating personnel of  
34 limited experience and brief training, previously unfamiliar with the equipment and  
35 functions of the installation. This manual shall supplement the technical manuals by  
36 relating the integration of the Main Engines, Reduction Gears, CPP Control Systems,  
37 Ship's Service Diesel Generators, Emergency Diesel Generator, switchboards and other

individual components. Duplication of material contained in the required technical manuals is not intended.

The following shall be included in the description of each system:

A. Index.

B. List of pertinent references such as installation drawings and manufacturers' instruction books.

C. General description of the system, and detailed descriptions and directions for operation, with reference to diagrams and schematics.

D. Warnings as to possible hazardous modes of operation and precautions required to minimize equipment damage and possible crew injury. These warnings shall be included in the text, either by means of a different type face, underscore, or an alternate print color.

E. For each piping and ventilation system, a straight line diagrammatic representation of the system, with each component identified.

F. For each piping system, the design functions and limitations of the system shall be discussed and detailed directions for operation of the system provided.

A tabulation of all machinery units shall be included, giving design functions and limitations, and expected operation conditions.

#### **100.25.5 Vendor and Sub-contractor Drawings**

Vendor-supplied drawings that are included as part of a manual or other deliverable to the WSF Representative shall be complete, legible and in reasonable conformance to drawing standards presented in drafting textbooks or other publications recognized generally by the drafting industry.

Most vendor-supplied drawings may be hand-drawn or prepared on electronic medium using AutoCAD® Release 2004, or later, or other drafting software. The exception to this rule is the case where the Contractor intends to submit vendor-supplied drawings as required Contract Drawings or As-Built Drawings. In these exceptional cases, the WSF Representative reserves the right to require that the drawings be developed in AutoCAD® Release 2004, or later, format; however, well-drafted hand-drawn plans **may** be deemed acceptable if pre-approved by the WSF Representative.

#### **100.26 PHOTOGRAPHS**

Progress photographs of each Vessel shall be taken during Phase III Detail Design and Construction stage of the Work and submitted to the WSF Representative monthly on CD-ROM or DVD-ROM media disks. All digital photos provided shall have a minimum resolution of at least 800 X 600 pixels. At least thirty-six (36) photographs shall be taken

1 each month of each Vessel at such locations as to best illustrate the progress of the Work on  
2 each Vessel. Date shall be shown on each photograph (date stamp function "ON") and  
3 labeled on the CD with Vessel name and a brief description of what the view is showing.  
4 Progress payments **will not** be made until all of the required monthly photographs have been  
5 received by the WSF Representative. At delivery of each Vessel, all construction  
6 photographs for that Vessel shall be combined onto one (1) DVD-ROM media disk and  
7 submitted to the WSF Representative.

8 At least seventy-two (72) photographs of the first Vessel shall be taken showing all major  
9 portions of the Work and provided to the WSF Representative on CD-ROM or DVD-ROM  
10 media disks. Full frame aerial view photographs of the Vessel at each End, each quarter, and  
11 both broadsides, preferably while on Sea Trials, shall be provided (date stamp function  
12 "OFF"). Consult the WSF Representative regarding the other views to be taken. The  
13 Contractor shall provide thirty-six (36) printed 8" × 10" color photographs (permanent  
14 photographic process prints, not digital printouts) selected by the WSF Representative from  
15 the final photographs taken of the first Vessel.

**(END OF SECTION)**